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THE AMERICAN ORB WEAVERS *HYPOGNATHA*, *ENCYOSACCUS*, *XYLETHRUS*, *GASTERACANTHA*, AND *ENACROSOMA* (ARANEAE, ARANEIDAE)

HEBERT W. LEVI¹

ABSTRACT. *Hypognatha* are tropical American orb weavers, presumed to be related to *Gasteracantha* on the basis of the shared wide, square carapace and elongate fourth femur. There are 38 species known, of which 30 (about 80%) are new (21% previously known, 79% new). Four species names, *coccinellina*, *cruciata*, *geometrica*, and *prospiciens*, are synonymized. Other presumed *Gasteracantha* relatives are illustrated and their distributions mapped: *Encyosaccus* with one species, and *Xylethrus* with six species, two of them new. Males of *Encyosaccus* and *Xylethrus* are described. Two *Xylethrus* names, *peruanus* and *trifidus*, are synonymized. The species-rich, worldwide genus *Gasteracantha* has only one American species and a single record of an African species found in Venezuela. There are six species of *Enacrosoma*, three previously named and three new species. Two species names, *leprosa* and *sexlobata*, are synonymized. *Glyptogona*, a Mediterranean genus, has frequently been confused with *Enacrosoma*.

INTRODUCTION

This work is another in a series of revisions of tropical American orb weavers. Earlier revisions were cited in Levi (1993b). Since that time, the following genera have been revised: *Carepalxis* and *Rubrepeira* (1992), *Neoscona* (1993a), *Lewisipeira* (1993c), *Kaira* (1993d), *Bertrana* and *Amazonepeira* (1994), *Acacesia* (Glueck, 1994), *Metazygia* (1995a), *Actinosoma*, *Spinepeira*, *Hingstepeira*, *Pronous*, *Spilasma*, *Micrepeira*, *Madrepeira*, and *Tatepeira* (1995b), and *Scoloderus* (Traw, in press).

Before this revision, only three species (*Hypognatha elaborata*, *H. furcifera*, and *H. scutata*) of the 11 names listed in cat-

alog of Roewer (1942) and Bonnet (1957) could be determined with the literature on hand. Yet it is astonishing how many specimens in collections have been determined and misidentified by arachnologists.

METHODS AND ACKNOWLEDGMENTS

Taxonomic publications must be short and to the point due to limited funds and time and because unnecessary data may confuse the diagnostic features of species and genera. It is most important to illustrate the diagnostic characters; descriptions can be kept to a minimum. Readers should remember that North American species briefly described by J. H. Emerton are generally recognizable; the multi-page descriptions and illustrations by A. Petrunkevitch often are not. Keyserling and the two Pickard-Cambridges generally made adequate illustrations and their species can be recognized. Descriptions by Thorell and Simon are difficult to use, and original specimens must be borrowed for accurate species recognition.

The methods used here were as described in Levi (1993b), but some additional comments are needed. Descriptions of the ocular quadrangle are from the outside of the curvature of the lens. Measuring the eyes was discussed in Levi (1993b). Distances between the eyes of the anterior row are expressed as diameters of the anterior median eyes (in profile); distances between eyes of the posterior row are given as diameters of the posterior median eyes (in profile). The height of the clypeus,

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the distance between anterior median eyes and the edge of the carapace, is expressed in the diameters of the anterior median eye (Levi, 1993b, fig. 28f). These measurements are approximate.

Measurements of sternum, palp, and the shorter articles of shorter legs are not given. While some leg measurements are useful, elaborate measurements of detailed descriptions can be distracting. Taking leg measurements of araneids is difficult without taking the animals apart, which is to be avoided. Accurate measurements of leg articles can be taken only if the legs are amputated and measured flat. In *Hypognatha*, taking the measurement of the first femur and also carapace length was especially difficult. Some earlier American authors reported accuracy of measurements to three decimal points, an unreasonable level of accuracy not supported by the methods used.

Hypognatha carapace length is measured between the clypeus to the farthest point on the posterior margin (but does not include eye projections). The width is measured at the widest point on the thorax and at the widest place in the cephalic region (just behind the posterior lateral eyes). In the gasteracanthine genera, which have a swollen cephalic region, the widest place of the carapace in the cephalic region was measured. The total length of the abdomen, if measured, was taken along the midline.

Measurements are usually to one-tenth of a millimeter for large species; smaller ones are measured to one-hundredth of a millimeter.

Epigyna were temporarily mounted with Hoyer's medium to search for seminal receptacles. The ducts of the *Hypognatha* epigynum are translucent, perhaps flattened, and difficult to see. There were not enough specimens of most species to stain tissues and make dissections. But again, the value of such dissections is questionable in helping to determine the species. They might be useful for making cladograms.

Record citation is also variable. There is no need to give date of collections and collector for common species just to be consistent. The location helps with distribution, and the museum's initials are needed for checking the data. No collection information is provided here for *Gasteracantha cancriformis* because it is a very common, widespread spider species. If printed the locality data and records of the available specimens would fill half the pages of this manuscript.

The specimens used came from the following collections:

- | | |
|------|--|
| AC | A. Calixto, Bogota, Colombia |
| AMNH | American Museum of Natural History, New York, United States; N. Platnick, L. Sorkin |
| BMNH | Natural History Museum, London, England; P. Hillyard, F. Wanless |
| CAS | California Academy of Sciences, San Francisco, California, United States; C. Griswold, W. J. Pulawski, D. Ubick |
| CV | Carlos Valderrama, Bogota, Colombia |
| FSCA | Florida State Collection of Arthropods, Gainesville, Florida, United States; G. B. Edwards |
| HECO | Hope Entomology Collections, Oxford University, Oxford, England; I. Lansbury, M. Atkinson |
| INPA | Instituto Nacional de Pesquisas da Amazônia, Manaus, Est. Amazonas, Brazil |
| LNK | Landessammlungen für Naturkunde, Karlsruhe, Germany; H. Höfer |
| MACN | Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina; E. A. Maurry, C. L. Scioscia |
| MCN | Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil; E. H. Buckup, M. A. L. Marques |
| MCP | Museu de Ciências, Pontifícia Universidade Católica do Rio |

- Grande do Sul, Porto Alegre, RS, Brazil; A. A. Lise
- MCSNG Museo Civico di Storia Naturale, Genova, Italy; L. Capocaccia, G. Arbocco
- MCZ Museum of Comparative Zoology, Cambridge, Massachusetts, United States
- MECN Museo Ecuatoriano de Ciencias Naturales, Quito, Ecuador; L. Avilés, Germania Estévez Jácome
- MHNC Museu de História Natural, Capão da Imbuia, Curitiba, Paraná, Brazil; L. Bittencourt
- MLJ Maria Luisa Jiménez, La Paz, Mexico
- MNHN Muséum National d'Histoire Naturelle, Paris, France; J. Heurtaut, C. Rollard
- MNRJ Museu Nacional, Rio de Janeiro, Brazil; A. Timotheo da Costa
- MUSM Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru; D. Silva D.
- MZSP Museu de Zoologia, Universidade de São Paulo, São Paulo, SP, Brazil; P. Vanzolini, J. L. Leme
- NRMS Naturhistoriska Riksmuseet, Stockholm, Sweden; T. Kronstedt
- PAN Polska Akademia Nauk, Warszawa, Poland; J. Prószyński, A. Słowjewska, W. B. Jedryczkowski
- SMIJ Science Museum, Institute of Jamaica, Kingston, Jamaica; T. H. Farr
- USNM National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States; J. Coddington, S. F. Larcher
- ZMUC Zoologisk Museum, Copenhagen, Denmark; H. Enghoff, N. Scharff
- ZSM Zoologische Staatssammlung, Munich, Germany

I would like to thank the curators and M. E. Galiano for making the specimens available and also thank the following: J.

Coddington, D. Silva D., and J. Warfel provided photographs; P. Vanzolini helped to find old Brazilian localities; L. Avilés, A. Calixto, J. Cracraft, D. Silva D., and A. Lise answered locality questions and provided natural history notes; G. Levy provided advice for *Glyptogona*; Maria-Luisa Jiménez loaned an unusually shaped *Gasteracantha*; G. Alayón provided a valuable *Xylethra* specimen; Lorna R. Levi improved the wording; A. Johnston read part of the manuscript; L. Leibensperger and W. Piel read the whole manuscript, suggesting word changes and improvements; and N. Scharff determined the *Gasteracantha camerunensis*, provided a male *Encycosaccus*, and made numerous suggestions for this manuscript. Two helpful, anonymous reviewers corrected misprints and made improvements. National Science Foundation grants BMS 75-05719 and DEB 76-15568 started the research on Neotropical araneids. Publication costs of this study were covered in part by the Wetmore Colles Fund.

TAXONOMIC SECTION

Hypognatha Guérin-Méneville

Eurysona C. L. Koch, 1839: 117. Type species *Aerosoma scutatum* (Perty) by monotypy. Name preoccupied by Dejean (1831) for a beetle, as cited in Neave (1939b: 366).

Hypognatha Guérin-Méneville, 1840: 109. Type species by monotypy *Hypognatha feisthameli* from Cayenne [= *Hypognatha scutata*]. The gender of the name is feminine (Bonnet, 1957: 2257). Neave, 1939b: 738.

Eurycornia Thorell, 1865: 4. New name for *Eurysona* C. L. Koch. First synonymized by Simon (1895b: 874).

Hypophthalma Taczanowski, 1873: 283. Type species by monotypy *Hypophthalma deplanata* Taczanowski. *Hypophthalma* first synonymized with *Hypognatha* by Simon (1895b: 874).

Calydna O. P.-Cambridge, 1874: 174. Type species by monotypy *C. prospiciens* O. P.-Cambridge [= *Hypognatha scutata*]. *Calydna* preoccupied by *Calydna* Doubleday for a lepidopteran (Neave, 1939a: 553). *Calydna* synonymized by Simon (1895b: 874).

Mutina O. P.-Cambridge, 1875: 231; 1881: 771. Replacement name for *Calydna*. The first citation, a footnote in *Zoological Record*, is not in Neave

(1940: 231). *Mutina* synonymized by Simon (1895b: 574).

Diagnosis. Abdomen with dorsum lightly sclerotized and a pattern of scutes, not otherwise found in American araneids (Figs. 17–19, 52, 55). Sternum with a posterior notch, holding a finger from the epigastric area (Figs. 1, 141), but there is no obvious stridulatory mechanism. Fourth femur elongated, almost equal to or as long as combined length of fourth tibia and tarsus and equal to or longer than first femur. Males with lateral eyes on the tip of a projection (Figs. 6–8, 28, 29).

A similar pattern of scutes on the dorsum of the abdomen is also found in some *Phoroncidia* (Theridiidae Levi, 1964). Unlike *Hypognatha*, *Phoroncidia* has the eye region projecting above the clypeus. A similar abdominal pattern is also found in *Testudinaria* (family affinity uncertain), which has a narrower carapace and abdomen than *Hypognatha*. It is also found in *Augusta* O. P.-Cambridge males and *Isoxya penzoides* Simon from Africa or Madagascar.

Description. Female. Color orange to orange-brown in alcohol. Abdomen with variable color pattern, often bold, often contrasting, but sometimes diffused, no two individuals of a species alike (Figs. 17–19). (Colors given in the descriptions, later, are those of the individual described.) Carapace only slightly longer than wide, its width behind the lateral eyes almost equal to or wider than width of thoracic region (Fig. 139). Anterior and posterior median eyes subequal, posterior medians at most 1.3 diameters of anterior medians. Lateral eyes about half diameter of anterior medians, anterior laterals often slightly larger than posterior. Anterior median eyes separated by less than their diameter to 1 diameter, posterior median eyes separated by less than one diameter to 1 diameter. Median ocular quadrangle almost square, often slightly wider behind. Height of clypeus 2.2 to 3.0 diameters of an anterior median eye (4 in *H. rancho*, only 1.4 in *H.*

saut). Clypeus variable in males (Figs. 6, 28, 42). Abdomen as long as wide, sometimes wider than long, or slightly longer than wide, widest in anterior half, with dorsum lightly sclerotized. Venter with two large plates anterior to pedicel (Fig. 72). A ring, not sclerotized, around spinnerets. Carapace bald; few setae on legs and abdomen. All species are similar in size, females less than 4 mm. Only *H. cryptocephala* is slightly larger, to 5 mm.

Males smaller than females, total length about 3 mm or less. Carapace of adults with a pair of projections tipped by the lateral pair of eyes (Figs. 6–8, 28, 29). Anterior lateral eyes facing ventrally. Some species with modifications on clypeus (Figs. 28, 35, 42), a median projection (Figs. 146–148, 157–159) and grooves, which are probably held by the female fang's when mating (Figs. 28, 48).

Early instar females have notch on sternum and indications of abdominal scutes, but in males only adults have the carapace modifications; the last instar shows no sign of them.

Genitalia. Females with epigynum reduced and some with little sculpturing on venter of epigynal area (Figs. 142, 162, 165); some even have little sculpturing on posterior of the epigynum (Figs. 132, 135). Seminal receptacles bunched like grapes or a complicated coil (Figs. 4, 23, 34, 59). Internal ducts lightly sclerotized, flattened, and not readily discerned.

Males with heavily sclerotized palpi, in contrast to lightly sclerotized epigynum. Palpus appears slightly twisted with paracymbium (P in Fig. 15) one-third distant to distal margin of cymbium (Y in Figs. 11, 15). Conductor (C in Figs. 11, 12, 14, 16, 152) soft, fleshy, wider than long, broadly attached to distal margin of tegulum (T in Figs. 11, 12, 16, 152). Conductor supports only part of long embolus (E in Figs. 16, 152). Elongate sclerite, probably paramedian apophysis (PM in Figs. 12, 14, 16), proximal to conductor. Median apophysis (M in Figs. 12, 13, 16, 152, 227) variable, in many species soft, swollen, and extend-

ing proximally to palpus, sometimes with one or two spines pressed against its swollen body (Figs. 227, 228). This soft median apophysis is reminiscent of the median apophysis in *Eustala* species (Levi, 1977, m in fig. 232). Embolus (E in Figs. 10, 11, 13, 16, 152) with distal end thread-like, similar in all species, and with complicated base. Thread of embolus supported by median apophysis, conductor, and terminal apophysis (Fig. 16). Terminal apophysis (A in Figs. 10–13, 16, 152, 153) large, dissected, and variable in genus; often with distal coil (Figs. 152, 153). Palpus without distal hematodocha, terminal apophysis attached to base of embolus (Figs. 11, 16) and always supporting tip of embolus.

Palpal patella with one short, weak seta (not always found). Endite without tooth. First coxa with small hook on distal margin, and small, matching groove on second femur. Second femur sometimes with ventral, median, short macrosetae. Second tibia thicker than first and sometimes with similar macrosetae. Coxal hook and strong second femur reflect only slight differential size of male and female; however, tooth on endite lost.

Relationship. The scutes of the abdomen, the sternum with notch holding an abdominal projection, and the twisted bulb of the palpus are autapomorphies for *Hypognatha*.

The wide cephalic region of the carapace and the almost square carapace resemble those of *Gasteracantha* (probably a synapomorphy). The presence of a terminal apophysis in the palpus and the complicated sclerites are plesiomorphic. *Hypognatha* species have a ring around the spinnerets, but the ring is not sclerotized (Table 1).

Distribution. *Hypognatha* is only known from tropical America, most species from the Amazon area (Maps 1, 2).

Natural History. The web of *H. mozambica* has been illustrated (Eberhard, 1986, fig. 4.2e). "Their webs are relatively flimsy, built in very large open spaces around dusk, and do not last very long be-

fore becoming quite tattered. The spiders seem to tear them down only a few hours after they have put them up" (Eberhard, personal correspondence, May 1995).

Misplaced Species. Bonnet's catalog (1957: 2258) lists the African *Eurysoma vicina* Blackwall (1866: 465) in *Hypognatha*. This species is listed in *Paraplectana* in Roewer (1942: 898). Blackwall's specimen was examined and found to be a large *Cacerostris*. This agrees with a note left by D. J. Clark in 1960 with the vial. The specimen would be *C. vinsoni* Thorell according to the revision by Grasshoff (1984). This is a NEW SYNONYMY.

Separating Species. The pattern of the abdominal plates is the same in all species. The coloration is variable within species, perhaps preventing predators from acquiring a search image. All are about the same size, only *H. cryptocephala* being larger than others. We do not know whether or not the shape of the abdomen can be used to separate species. Only a few individuals were available of species that had the abdomen distinctly shaped. Thus, we do not know whether the anterior border of the abdomen of *H. tocantins* reflects variability of an individual or is characteristic of the species. The females are difficult to separate because the epigynum is simple and areas on its ventral face vary in sclerotization. Sometimes clues are provided by the posterior view or the internal placement of the seminal receptacles. The variation of the internal genitalia is not known, and they have not been used in the key.

To study the posterior face of the epigynum, make a slight cut with a mounted minutennadel to one side of the epigynum and a small cut anterior so the epigynum can be lifted. The epigynum, being lightly sclerotized, is easily damaged.

In contrast to females, males are easy to separate: many have diagnostic anterior projections from the carapace, and the median apophysis differs in different species, as does the complicated terminal apophysis, which for the most part is hid-

TABLE 1. SOME CHARACTERS BELONGING TO THE GENERA REVISED HERE AND *COLPHEPTRA*, *GLYPTOGONA*, *MICRATHENA*, and *ASPIDOLASIUS*.

	IYP	ENC	XVL	GAS	MIC	ENA	GLY	COL	ASP*
Female									
Carapace square	-	+	-	+	-	-	-	-	+
Deep thoracic groove on carapace	-	+	-	-	[+]/-	-	-	-	+
Cephalic region as wide as thoracic	+	+	-/+	+	-	-	-	-	+
Cephalic region high	-	+	+	+	-	-	-	-	+
Thoracic region high	-	-	-	-	[+]/-	-	[2]	-	-
Clypeus high, more than 2X anterior median eyes	[1]	-	[2]	-	[+]	[3]	-	-	-
Sternum posterior, truncate or grooved	[1]	+	+	+	[+]	[3]	-	-	-
Femur 4 as long or longer than femur 1	+	+	+	+	[+]	[6]	-	-	-
Leg 4 longer than 1	-	+	[2]	+	[3]	+	-	-	-
Abdomen with sclerotized plates, spots	[1]	+	[3]	+	[5]	+	-	-	-
Abdomen shape	[1]	[2]	[3]	[4]	-	[7]	[8]	[9]	[9]
Abdomen with median posterior tubercles	-	-	+	-	-	-	-	-	-
Stridulating ridges on book lungs	-	-	-	-	[+]/-	-	-	-	-
Sclerotized ring around spinnerets	-	-	+	+	+	+	-	-	-
Carapace with rim	-	-	+	+	[+]/-	-	-	-	-
Male									
Tarsal organ, P free, conical tibia	-	-	-	-	-	-	-	-	+
♂ Smaller than ♀, % of ♀ carapace width	77-95	37	25	25	28-56	75-94	106	100	30
Carapace square	+	+	-/+	-	-	-	-	-	+
Cephalic region almost as wide as thoracic	-	-	+	+	-	-	-	-	+
Cephalic region high	[+]	-	-	-	-	-	-	-	-
Lateral eyes on tip of projection	-	-	-	[+]	-	-	-	-	-
Median eye region projecting	[1]	-	-/+	-	-	-	[2]	-	-
Clypeus high, more than 2X anterior median eyes	[1]	-	[2]	[3]	-	[4]	-	-	-
Sternum	+	-	+	-	+	-	-	-	-
Femur 4 longer than femur 1	-	-	-	-	[+]	-	-	-	-
Leg 4 longer than leg 1	-	-	-	-	-	+	+	+	-
Endite tooth	+	-	-	-	-/+	+	+	+	-
Coxal hook	+	-	-	-	-	+	+	+	-
Setae on palpal patella	+	+	+	+	-	+	+	+	+
Palpal bulb wider than long	-	+	+	-	-/+	-	+	+	-
Palpus with terminal apophysis	-	+	+	-	-/+	+	+	+	-
Palpus with paramedian apophysis	+	+	+	+	+	+	+	+	-
Abdomen with sclerotized plate or spots	[1]	+	[2]	+	+	+	-	-	[3]
Abdomen shape specialized	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Sclerotized rings around spinnerets	-	-	+	+	+	+	-	-	-

* *Aspidolasius*, revised separately, is a tetragnathid.

† Coxal hook of male present when males are approximately more than 53% of size of females and absent when males are less than 53% of size of female, measured by percentage of width of carapace.

Genera: ASP, *Aspidolasius*; COL, *Colpheptra*; ENA, *Euacrosoma*; ENC, *Encycosurus*; GAS, *Gasteracantha*; GLY, *Glyptogona*; IYP, *Hypognatha*; MIC, *Micrathena*; XVI, *Xylothrips*.

Codes: +, present; -, absent; -/+, absent, present in some species; [], an autapomorphy of genus.



Map 1. Distribution of *Hypognatha* species.

den between cymbium, tegulum, and embolus (Fig. 16).

KEY TO FEMALES OF *HYPOGNATHA*

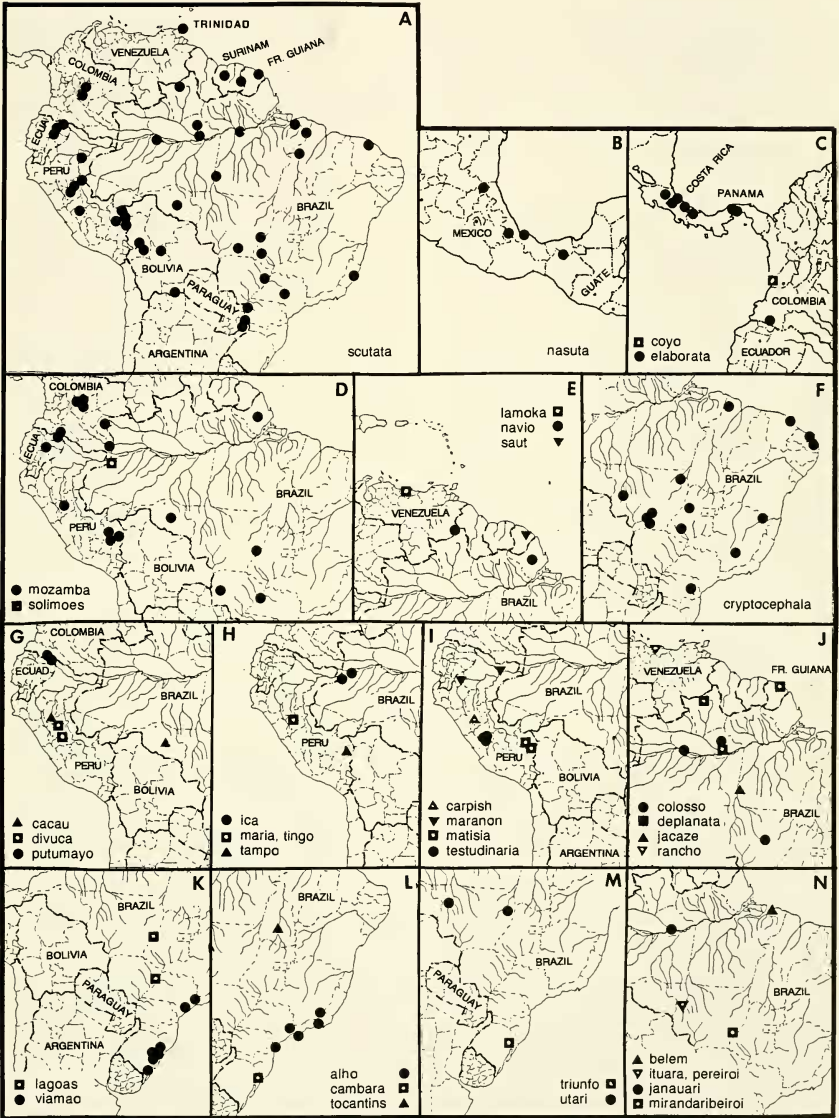
Females of *H. cacau*, *H. carpish*, *H. furcifera*, *H. jacaze*, *H. maria*, and *H. tingo* are unknown or have not been matched to males.

The key is based entirely on the structure of the epigynum.

- 1. Ventral view of epigynum with the upper portion of two light circles visible at posterior margin (Figs. 56–58) (in part) *scutata*
- Epigynum otherwise 2

- 2(1). Ventral view with a scape-like structure, as in Figure 67 *navio*
- Epigynum otherwise 3
- 3(2). Posterior margin of epigynum has two margins, a transverse keel anterior and one posterior (Figs. 216, 217) *colosso*
- Epigynum otherwise 4
- 4(3). Venter of epigynum with sclerotized sculpturing (Fig. 64) or a lightly sclerotized hump (Figs. 196, 200), neither of which is connected with the posterior margin 5
- All ventral sculpturing connected with posterior margin, or no sculpturing (Figs. 2, 24, 31, 56, 57, 77, 106) 6

5(4). Venter with small, median depression having a posterior lip (Fig. 64)	<i>saut</i>	—	Epigynum otherwise (Figs. 106, 168, 208)	17
— Venter with median hump (Figs. 196, 200)	<i>deplanata</i>	17(16).	Posterior face of epigynum with pair of dark circles separated by less than their diameter (Fig. 107)	<i>viamao</i>
6(4). Ventral sculpturing connected to posterior margin (Figs. 2, 24, 31, 38, 45, 95)	7	—	Posterior face with three round to cornered light areas, equal in diameter (Fig. 169)	<i>triumfo</i>
— No ventral sculpturing except for lobes and notches of posterior margin, and sculpturing visible behind margin (Figs. 56, 77, 106, 112, 142, 154)	12	18(13).	In ventral view of posterior margin two distinct light circles touch margin from posterior (Figs. 56–58) .. (in part)	<i>scutata</i>
7(6). Venter with a transverse lip covering a median longitudinal line formed by adjacent lips or a depression (Figs. 2, 24, 31, 38, 45)	8	—	Epigynum otherwise	19
— Venter with longitudinal groove without lip (Fig. 95)	<i>mirandaribeiroi</i>	19(18).	Posterior margin slightly concave, with a pair of lobes pressing against each other posteriorly (Figs. 20, 21)	<i>tampo</i>
8(7). Posterior face with narrow, longitudinal, median plate (at 6 hr in Fig. 3)	—	—	Epigynum otherwise	20
— Posterior face with median groove (Figs. 26, 33, 40, 46)	9	20(19).	Posterior face with a pair of coiled margins (Figs. 143, 166, 184)	21
9(8). In posterior view parallel margins of lateral plates touching (Figs. 26, 33)	10	—	Epigynum otherwise	23
— In posterior view lateral plates, separated or touching only at small denticle lips (Figs. 40, 46, 97)	11	21(20).	Coils ventral (Fig. 143)	<i>elaborata</i>
10(9). In ventral view width of anterior transverse edge about one-half length of visible longitudinal lips (Fig. 31)	<i>mozamba</i>	—	Coils dorsal (Figs. 166, 184)	22
— In ventral view width of anterior transverse edge about two-thirds length of visible longitudinal lips (Fig. 24) ..	<i>lagoas</i>	22(21).	Coils in a triangular light area (Fig. 184)	<i>divuca</i>
11(9). Epigynum as in Figures 45 and 46; Mexico	<i>nasuta</i>	—	Coils in a transverse rounded light area (Fig. 166)	<i>maranon</i>
— Epigynum as in Figures 35–40; Venezuela	<i>lanoka</i>	23(20).	Posterior face with circular, light, often indistinct, disks (Figs. 120, 136, 155, 172, 191, 194)	28
12(6). Ventral view of epigynum with shadows of two longitudinal bands, each bent on proximal end (Fig. 208), posterior with indistinct markings (Fig. 209)	<i>putumayo</i>	—	Posterior face otherwise (Figs. 78, 132, 163, 176, 209, 230)	24
— Epigynum otherwise	13	24(23).	Posterior face of epigynum concave (Fig. 176)	<i>alho</i>
13(12). Posterior margin with notches or lobes (Figs. 88, 106, 112, 128, 168, 208)	14	—	Epigynum otherwise (Figs. 78, 132, 163, 209, 230)	25
— Posterior margin straight or slightly curved without lobes or notches (Figs. 20, 56, 77, 142, 154, 162, 175)	18	25(24).	Posterior face with sclerotized, transverse shield (Fig. 132)	<i>belem</i>
14(13). Posterior margin with large notch (Fig. 128)	<i>percivroi</i>	—	Posterior face otherwise (Figs. 78, 163, 230)	26
— Epigynum otherwise (Figs. 88, 106, 112, 168, 208)	15	26(25).	Posterior face with shadows of coils dorsally (Fig. 163)	<i>coyo</i>
15(14). Posterior margin with two indentations (Fig. 88)	<i>ituara</i>	—	Posterior face otherwise (Figs. 78, 230)	27
— Posterior margin with lobes (Figs. 106, 112, 208)	16	27(26).	Epigynum posterior face with light trapezoid area containing shadows of upside-down Js (Fig. 230)	<i>tocantins</i>
16(15). Posterior lobe large, round, covered with tip of triangular sclerotized area (Fig. 112)	<i>cambara</i>	—	Posterior view of epigynum with median light area widening near ventral margin (Fig. 78)	<i>testudinaria</i>
		28(23).	Posterior face with a pair of scales (Fig. 191), anterior with shadows of two parallel, longitudinal bands (Fig. 190)	<i>rancho</i>
		—	Epigynum otherwise	29
		29(28).	Ventral view with a sclerotized shield and two lateral, projecting bands (Fig. 171); posterior with two circles separated by slightly less than their diameter (Fig. 172)	<i>utari</i>
		—	Epigynum otherwise	30
		30(29).	Posterior face with light disks within wide frames (Figs. 120, 136)	31



Map 2. Distribution of *Hypognatha* species.

– Epigynum otherwise (Figs. 155, 194) ... 32
 31(30). Venter of epigynum with sclerotized triangular area (Fig. 119) *mattisia*
 – Venter as in Figure 134, posterior as in Figure 136 *januvari*
 32(30). In posterior view, with light disks touching (Fig. 194) *solinoes*
 – In posterior view, light disks separated (Fig. 155) *ica*

KEY TO MALES OF *HYPOGNATHA*

Males of *H. alho*, *H. belem*, *H. coyo*, *H. ituara*, *H. januvari*, *H. maranon*, *H. mirandaribetiroi*, *H. pereiroi*, *H. rancho*, *H. saut*, *H. solinoes*, *H. tempo*, *H. tocantins*, *H. triunfo*, and *H. utari* are unknown.

1. Clypeus with median projection (Figs. 48, 49, 54, 123-125) 13
 – Clypeus without median projection, sometimes with other median sculpturing (Figs. 6-8, 61, 92) 2
 2(1). Lateral eyes, as seen in subdorsal view, on a projection longer than wide (Figs. 29, 86, 93, 101, 104) 8
 – Lateral eyes on a wider than long or as wide as long projection (Figs. 7, 43, 62, 75, 110, 116) 3
 3(2). Median area of clypeus with sculpturing (Figs. 42, 61, 109, 115) 4
 – Median area of clypeus without sculpturing (Figs. 6, 73) 7
 4(3). Clypeus with median transverse groove (Figs. 42, 61) 5
 – Clypeus without such groove (Figs. 109, 115) 6
 5(4). Venter of clypeus with a median bulge (Fig. 42) *lamoka*
 – Venter of clypeus with a median depression (Fig. 61) *scutata*
 6(4). Median apophysis with an "upper", small, sharp tooth (Fig. 111) *viamao*
 – Median apophysis forming a transverse gutter (Fig. 118) *cambara*
 7(3). Distal end of palpus with a projecting terminal apophysis (at 12 hr in Fig. 9) *criptocephala*
 – Distal end of palpus with terminal apophysis forming a coil (at 11 hr in Fig. 76) *navio*
 8(2). Median area of clypeus with sculpturing (Figs. 28, 35, 92) 9
 – Median area of clypeus plain (Figs. 85, 100, 103) 11
 9(8). Clypeus with median dorsoventral ridge (Figs. 28, 35) 10
 – Clypeus with small, median, distally divided tubercle (Fig. 92) *carpish*
 10(9). Terminal apophysis of palpus with a tooth (at 12 hr in Fig. 37) *mozamba*
 – Terminal apophysis of palpus without tooth (at 12 hr in Fig. 30) *lagoas*

11(8). Median apophysis with three large prongs (at 4 hr in Fig. 105) *maria*
 – Median apophysis otherwise (Figs. 87, 102) 12
 12(11). Median apophysis extends toward distal end of palpus, terminal apophysis a truncate, flat projection (Fig. 102) *tingo*
 – Median apophysis extends toward lateral, proximal end of palpus; terminal apophysis with pointed projection (Fig. 87) *testudinaria*
 13(1). Tip of median clypeal projection pointed (Figs. 49, 180) 14
 – Tip of median clypeal projection truncate or biforked (Figs. 124, 147, 158, 187, 204) 15
 14(13). Median apophysis relatively small, distally pointed (Figs. 50, 51); Mexico *nasuta*
 – Median apophysis long, projecting, bent at a right angle (Figs. 181, 182) *cacau*
 15(13). Median apophysis short, sclerotized (Figs. 150, 151, 160) 16
 – Median apophysis long, soft, extended (Figs. 126, 188, 206, 214, 223, 228, 235) 17
 16(15). Terminal apophysis a thick coil (at 12 hr in Figs. 150, 151) *elaborata*
 – Terminal apophysis otherwise, median apophysis with one forward, one reverse hook (Fig. 160) *ica*
 17(15). In mesal view median apophysis triangular, pointed (Figs. 127, 189) 18
 – Median apophysis otherwise in mesal view (Figs. 207, 215, 224, 227, 236) 19
 18(17). Two spines of median apophysis close to each other (Fig. 127) *mattisia*
 – Two spines of median apophysis widely separated (Fig. 189) *divuca*
 19(18). Sickle-shaped terminal apophysis within loop of embolus (Fig. 228); median apophysis with four bulges (M in Fig. 227) *furfifera*
 – Terminal apophysis not sickle-shaped, or sickle-shaped structure above base of embolus (Figs. 206, 214, 223, 235); median apophysis with two or three bulges (Figs. 207, 215, 224, 236) 20
 20(19). Terminal apophysis sickle-shaped, above base of embolus (Figs. 206, 214, 223) 21
 – Terminal apophysis not sickle-shaped, above base of embolus (Fig. 235) *jacaze*
 21(20). Median apophysis with three bulges (Figs. 206, 207) *deplanata*
 – Median apophysis otherwise (Figs. 215, 223) 22
 22(21). Median apophysis as in Figures 214 and 215 *putumayo*
 – Median apophysis as in Figures 223 and 224 *colosso*

Hypognatha cryptocephala

Mello-Leitão

Figures 2-16; Map 2F

Hypognatha cryptocephala Mello-Leitão, 1947: 246, fig. 12, ♀. Female holotype from Vila Velha, Ponta Grossa [Paraná State, Brazil], in MNHC, examined. Brignoli, 1983: 271.

Note. The female holotype is shrivelled and was wrapped in fungal mycelium. The abdomen was carefully cleaned using an ultrasonic vibrator and needles. The specimen had a label, "*H. coccinelloides*". The epigynum has a posterior, median plate shaped as in other specimens, but the ventral lip (facing posteriorly) is slightly more curved medially than in the illustration (Fig. 3). The measurements of this, the largest *Hypognatha* species, are almost the same as those in the description by Mello-Leitão.

Description. Female from Cuiabó, Mato Grosso, Brazil. Carapace, chelicerae, endites, sternum orange-brown. Coxae, legs reddish brown; distal articles of legs orange. Abdomen reddish brown with pairs of white patches (Fig. 5); venter black. Chelicerae with six anterior teeth. Total length 4.8 mm. Carapace 2.3 mm long, 2.0 wide in thoracic region, 2.1 wide in cephalic region. First femur 1.2 mm, patella and tibia 1.5, metatarsus 1.1, tarsus 0.5. Second patella and tibia 1.4 mm, third 1.1. Fourth femur 1.5 mm, patella and tibia 1.5, metatarsus 1.0, tarsus 0.5. Abdomen 4.5 mm long, 4.8 wide.

Male from Cuiabó, Mato Grosso, Brazil. Coloration as in female. Venter of first two femora with short macrosetae, three on first, two on second. Abdomen as in female. Total length 4.5 mm. Carapace 2.1 mm long, 1.8 wide in thoracic region, 1.8 wide in cephalic region. First femur 1.2 mm, patella and tibia 1.6, metatarsus 1.2, tarsus 0.6. Second patella and tibia 1.4 mm, third 1.0. Fourth femur 1.3 mm, patella and tibia 1.3, metatarsus 1.0, tarsus 0.5. Abdomen 3.4 mm long, 3.4 wide.

Note. Males and females were collected together.

Variation. Total length of females 4.0 to 6.0 mm, males 3.2 to 3.8. The illustrations (Figs. 2, 3, 5) of the female were of a specimen from Minas Gerais, Figure 4 of a female from Santo Antonio, the male from specimens from Mato Grosso.

Diagnosis. The female is larger than females of any other species and the epigynum, in posterior view, has a distinct, narrow, median plate (Fig. 3). The male palpus, unlike others, has a distal projection, a part of a sclerite between embolus and terminal apophysis (Fig. 9, A in Figs. 12, 13).

Specimens Examined. BRAZIL *Maranhão:* Aldeia Maracaçumé, Rio Maracaçumé, 80 km E Camindé, 22, 23 May 1963, 1♀ (B. Malkin, AMNH). *Ceará:* Fortaleza, June-Sept. 1911, 9♀ (W. M. Mann, MCZ). *Rio Grande do Norte:* Fazenda Canaã [05°57'S, 35°26'W], 24 Feb. 1952, 3♀, 7♂ (M. Alvarenga, MZSP 7970). *Paraná:* Independência [Guarabira], 1911, 2♀, 8 imm. (W. M. Mann, MCZ). *Goias:* Acieiro, Jataí, Oct. 1962, 4♀, 1♂ (Exped. Mus. Zool., MZSP 3091, 4191, 4192, 8329), Dec. 1963, 1♀ (M. Alvarenga, AMNH); Goias, 4♀ (MNH 21621). *Mato Grosso:* Barra do Tapirapé, 5-23 Nov. 1964, 1♀ (B. Malkin, AMNH); Chapada dos Guimarães, Nov. 1963, 3♀ (M. Alvarenga, AMNH); Cuiabá, Nov. 1963, 2♀, 1♂ (M. Alvarenga, AMNH); Santo Antônio de Leverger, 6 Oct. 1981, 12♀, 11♂ (M. I. Maeques, MCP 2525); Utiariti, Oct. 1966, 1♀ (Lanko, P. F. S. Pereiro, MZSP 5608). *Minas Gerais:* Lagoa Santa, 1♂ (Reinhardt, ZMUC); Pedra Azul, Dec. 1970, 2♀ (P. M. Oliveira, AMNH).

Hypognatha tampo new species

Figures 20-23; Map 2H

Holotype. Female holotype from Zona Reservada Tambopata, 290 m, Depto. Madre de Dios, 12°50'S, 69°17'W, Peru, 11 May to 12 June 1988 (D. Silva D.), in MUSM. The specific name is an arbitrary combination of letters.

Description. Female holotype. Carapace dark orange, sides of thoracic region dusky. Chelicerae, endites, sternum, dark orange, with sternum dusky. Legs light orange. Abdomen orange underlaid by white pigment spots, with venter gray. Total length 3.2 mm. Carapace 1.43 mm long, 1.15 wide in thoracic region, 1.14 wide in cephalic region. First femur 0.91 mm, patella and tibia 0.92, metatarsus 0.68, tarsus 0.40. Second patella and tibia 0.92 mm,

third 0.62, fourth 0.89. Fourth femur 0.91 mm. Abdomen 2.6 mm long, 2.9 wide.

Diagnosis. In *H. tampo*, lateral and posterior margins of the transverse depression are sclerotized (Figs. 21, 22), whereas in *H. lagoas* and *H. mozamba* the anterior and lateral margins are sclerotized (Figs. 24, 25, 31, 32). Also, *H. tampo* has the posterior median slit shorter (Fig. 22) than in the other two species (Figs. 26, 33), and the internal genitalia appear to be two areas about as wide as long (Fig. 23), whereas the two other species have cone-shaped internal genitalia (Figs. 27, 34).

Specimens Examined. No other specimens were found.

Hypognatha lagoas new species

Figures 24–30; Map 2K

Holotype. Male holotype from Três Lagoas, Mato Grosso do Sul, Brazil, 16 Sept. 1964 (Exped. Dept. Zool.), in MZSP no. 3651. The specific name is a noun in apposition after the locality.

Description. Female from Chavantina. Carapace, chelicerae, endites, sternum, orange. Legs light orange. Abdomen dorsum white with light orange plates, venter light gray. Posterior median eyes same diameter as anterior medians, laterals 0.6 diameter. Total length 2.7 mm. Carapace 1.46 mm long, 1.15 wide in thoracic region, 1.18 wide in cephalic region. First femur 0.92 mm, patella and tibia 1.03, metatarsus 0.67, tarsus 0.44. Second patella and tibia 0.96 mm, third 0.65, fourth 0.92. Fourth femur 0.95 mm. Abdomen 2.8 mm long, 2.7 wide.

Male holotype. Coloration as in female. Second tibia with four, short, ventral macrosetae. Total length 2.5 mm. Carapace 1.30 mm long, 1.08 wide in thoracic region, 1.04 wide in cephalic region. First femur 0.89 mm, patella and tibia 1.03,

metatarsus 0.81, tarsus 0.43. Second patella and tibia 0.93 mm, third 0.61, fourth 0.87. Fourth femur 0.87 mm. Abdomen 2.0 mm long, 2.0 wide.

Note. The match of males and females is uncertain. They were placed together because of their similarities to *H. mozamba*.

Variation. Total length of females 2.7 to 3.4 mm. The female in the MZSP had the abdomen wider than long and had a median tubercle in the center of median and lateral plates. The illustrations were from the holotype and the female described.

Diagnosis. In *H. lagoas* the anterior transverse lip is larger and closer to the posterior margin of the epigynum (Fig. 24) than in *H. mozamba* (Fig. 31). The male clypeus of *H. lagoas* has two depressions, perhaps to hold the female fang when mating (Fig. 28); these depressions are absent in *H. mozamba* (Fig. 35). The terminal apophysis of the palpus (Fig. 30) differs from that of *H. mozamba* by lacking the distal tooth present in the palpus of *H. mozamba* (at 12 hr in Fig. 37).

Specimens Examined. BRAZIL, Mato Grosso: Chavantina, July 1946, 1♀ (H. Sick, MZSP S047), June 1947, 1♀ (G. Carvalho, MNRJ).

Hypognatha mozamba new species

Figures 1, 31–37, 52, 53; Map 2D

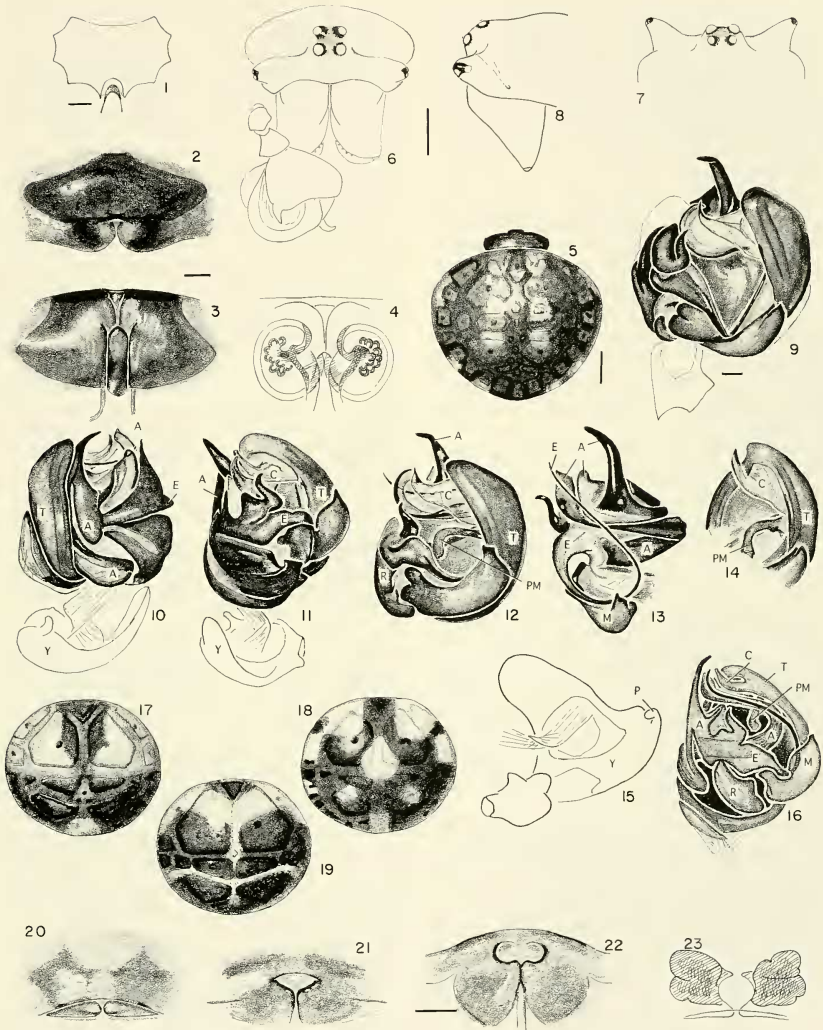
Holotype. Male holotype, one female and two male paratypes from Hacienda Mozambique, 500 m, 15 km SW Puerto Lopez, Depto. Meta, Colombia, no date (W. Eberhard), in MCZ. The specific name is an arbitrary combination of letters.

Hypophthalma sp., Eberhard, 1956: 73.

Description. Female paratype. Carapace, chelicerae, sternum orange. Coxae, legs light orange. Abdomen orange with white pigment spots; venter orange-gray. Abdomen with central, dorsal hump (Fig.

Figure 1. Sternum of *Hypognatha mozamba*.

Figures 2–16. *H. cryptocephala* Mello-Leitão. 2–5, female. 2–4, epigynum. 2, ventral. 3, posterior. 4, cleared. 5, dorsal. 6–16, male. 6, eye region, chelicerae and right palpus. 7, eye and chelicera, subdorsal. 8, eye region, lateral. 9–16, left male palpus. 10–16, palpus pulled apart. 10, mesal. 11, mesoventral. 12, ventral. 13, bulb, dorsal. 14, ventral showing conductor and paramedian apophysis. 15, cymbium. 16, ventral, diagrammatic.



Figures 17-19. Dorsal pattern of abdomen of three immature *H. colosso* collected together.

Figures 20-23. *H. tampo* n. sp., epigynum. 20, ventral. 21, ventroposterior. 22, posterior. 23, cleared.

Abbreviations. A, terminal apophysis. C, conductor. E, embolus. M, median apophysis. P, paracymbium. PM, paramedian apophysis. R, radix. T, tegulum. Y, cymbium.

Scale lines. 1.0 mm; Figure 1 and genitalia 0.1 mm; eye regions 0.5 mm.

52). Total length 3.8 mm. Carapace 1.60 mm long, 1.36 wide in thoracic region, 1.35 wide in cephalic region. First femur 1.01 mm, patella and tibia 1.15, metatarsus 0.78, tarsus 0.44. Second patella and tibia 1.08 mm, third 0.84, fourth 1.05. Fourth femur 1.06 mm. Abdomen 2.9 mm long, 3.1 wide.

Male holotype. Coloration as in female. Sternum as wide as long. No macrosetae on second femur. Abdomen as in female. Total length 2.5 mm. Carapace 1.40 mm long, 1.07 wide in thoracic region, 1.04 wide in cephalic region. First femur 0.84 mm, patella and tibia 1.13, metatarsus 0.90, tarsus 0.42. Second patella and tibia 0.99 mm, third 0.65, fourth 0.90. Fourth femur 0.87 mm. Abdomen 2.1 mm long, 2.1 wide.

Note. Males and females were easily matched, as numerous males and females were collected together.

Variation. Total length of females 2.8 to 4.2 mm, males 2.1 to 2.8. The illustrations were made from the holotype and paratypes.

Diagnosis. The female can be separated from that of *H. lagoas* by having the median slit of the epigynum (Fig. 31) more than twice the width of the anterior depression in *H. mozamba*, less than twice in *H. lagoas* (Fig. 24). The male palpus in *H. mozamba* differs by having a tooth on the terminal apophysis (at 12 hr in Fig. 37), absent in *H. lagoas* (Fig. 30).

Natural History. The species has been collected in rainforest in Rondônia. The web was illustrated by Eberhard (1986: 73, fig. 4.2e).

Paratypes. COLOMBIA *Meta:* Hacienda Mozambique, 15 km SW Puerto Lopez, 200 m, no date, 2♀,

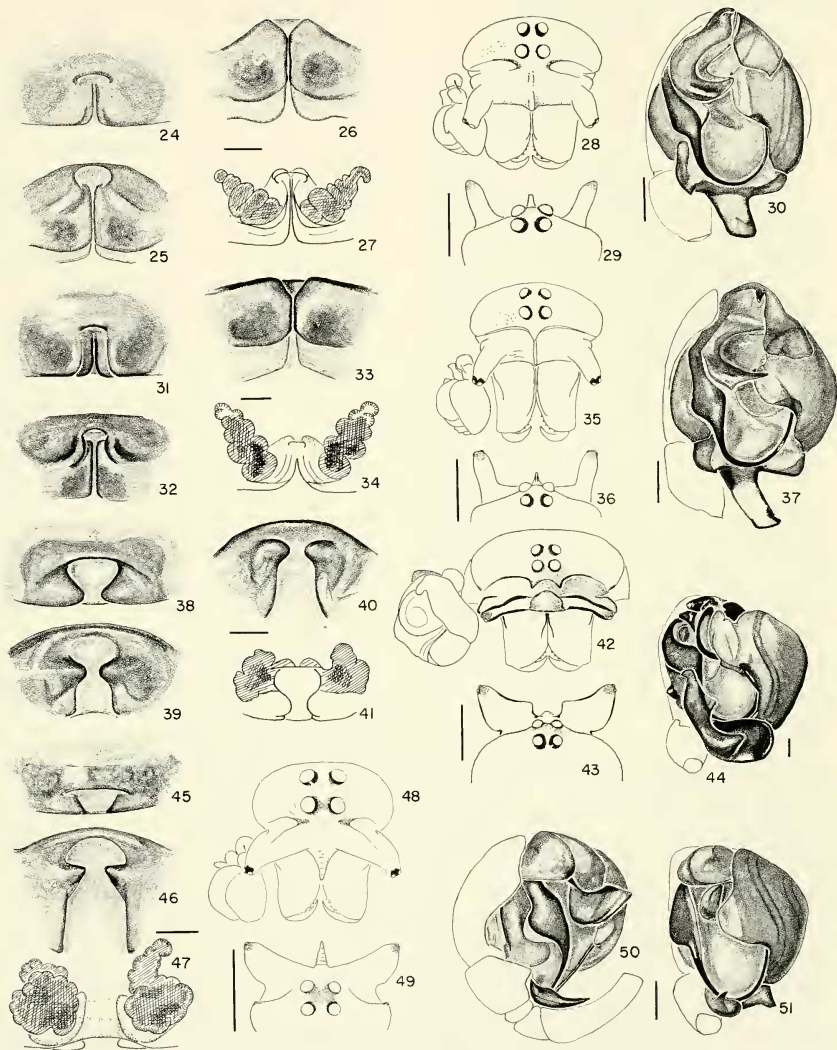
3♂ (W. Eberhard I499, MCZ), July 1978, 2♀, 2♂ (W. Eberhard 1619, 1714, MCZ); Aug. 1978, 1♀ (W. Eberhard, MCZ).

Specimens Examined. COLOMBIA *Meta:* Lomalinda, 300 m, Puerto Lleras, 3°16'N, 73°23'W, 10 Nov. 1985, 1♀ (B. Carroll, MCZ), May 1987, 1♀; June 1987, 1♀; Aug. 1988, 1♀ (all B. Carroll, CAS), Mar. 1987, 1♀ (V. B. Roth, CAS); Villavicencio, 24 July 1938, 1♀ (H. Dybas, MCZ). *Vaupés:* Mitú, 200 m, Feb. 1975, 1♀ (P. A. Schmeble, MCZ). *Putunayo:* Buena Vista, 0°25'N, 76°25'W, 23–29 July 1972, 2♀ (W. Eberhard, MCZ). *Amazonas:* Río Pira, Río Apaporis, 0°25'N, 70°15'W, 7–15 Feb. 1989, 1♀ (V. B. Roth, CAS). ECUADOR *Sucumbios:* Limon Coda [Limoncococha], 10 Aug. 1965, 1♀ (C. B. Patrick, MCZ); Río Tarpo, 28 Apr. 1989, 1♀ (L. Aviles, MECN); Río Tarapuy, junction road from Tarapoa, 24 June 1988, 4♀, 5♂ (W. Maddison, MCZ); Tarapoa, 0°07'S, 76°20'W, 5♀ (W. Maddison, MCZ); bridge over Río Cuyabeno, 00°18'S, 76°18'W, 25–30 June 1988, 3♀ (W. Maddison, MCZ). *Napo-Pastaza:* Huagra-Yacu, "Oriente" (Brown, 1941), Apr. 1941, 1♀ (W. Clarke-Macintyre, AMNH). *Pastaza:* Puyo, 18 Apr. 1955, 4♀ (R. W. Hodges, MCZ); 4.5 km N Puyo, 953 m, 9 Feb. 1955, 1♀, 1 imm. (E. I. Schlinger, E. S. Ross, CAS). PERU *Huánuco:* El Castillo, Tingo María, 2 June 1967, 2♀ (A. F. Archer, S. Ricco, AMNH); Tingo María, 1♀ (J. C. Pallister, AMNH), Oct. 1946, 1♀, 1♂, Dec. 1946, 1♀ (both W. Weyrauch, AMNH). *Cuzco:* Quincemil, 720 m, 24–27 Apr. 1947, 1♀ (J. C. Pallister, AMNH). *Madre de Dios:* Zona Reservada de Manu, Puesto de Control Pakitza, 11°58'S, 71°18'W, 25 Sept. 1987, 1♂ (J. Codrington, D. Silva D., USNM); Zona Reservada Pakitza, 11°58'S, 71°18'W, 26 Sept. 1987, 1♀ (J. Codrington, D. Silva D., MUSM); Tambopata Reserve, Río Tambopata, 30 Mar. 1988, 1♀ (J. Palmer, D. Smith, MCZ); Río Alto Madre de Dios, Playa Maronal, 24 Oct. 1987, 1♀ (D. Silva D., MUSM). BRAZIL *Amapá:* Serra do Navio, July 1966, 1♀ (M. E. Galiano, MACN). *Rondônia:* Fazenda Rancho Grande nr. Cacaaulandia, 6–15 Dec. 1990, 3♀, 1♂ (C. B. Edwards, FSCA). *Mato Grosso:* Chavantina, Dec. 1946, 1♀ (H. Sick, MZSP 8047), June 1947, 1♀, 1 imm. (J. G. Carvalho, MNRJ). *Mato Grosso do Sul:* Pousada Caiman, Miranda, 6 May 1991, 1♀ (A. C. Meyer, MCN 21002). *São Paulo:* Lussanvira, 1♀ (R. Arlé, MNRJ).

Figures 24–30. *Hypognatha lagoas* n. sp. 24–27, epigynum. 24, ventral. 25, ventroposterior. 26, posterior. 27, cleared. 28–30, male. 28, eye region, chelicerae and right palpus. 29, eye region, subdorsal. 30, left palpus.

Figures 31–37. *H. mozamba* n. sp. 31–34, epigynum. 31, ventral. 32, ventroposterior. 33, posterior. 34, cleared. 35–37, male. 35, eye region, chelicerae and right palpus. 36, eye region, subdorsal. 37, palpus.

Figures 38–44. *H. lamoka* n. sp. 38–41, epigynum. 38, ventral. 39, ventroposterior. 40, posterior. 41, cleared. 42–44, male. 42, eye region, chelicerae and right palpus. 43, eye region, subdorsal. 44, palpus.



Figures 45-51. *H. nasuta* O. P.-Cambridge. 45-47, epigynum. 45, ventral. 46, posterior. 47, cleared. 48-51, male. 48, eye region, chelicerae and right palpus. 49, eye region, subdorsal. 50, palpus, mesal. 51, palpus, ventral.

Scale lines. Eye regions 0.5 mm; genitalia 0.1 mm.

Hypognatha lamoka new species

Figures 38–44; Map 2E

Holotype. Male holotype from La Moka, Caracas, Venezuela, 5–7 Aug. 1891 (Meinert), in ZMUC. The specific name is a noun in apposition after the locality. La Moka is assumed to be the name of a house.

Description. Female paratype. Carapace, chelicerae, endites, sternum orange-brown. Legs orange-brown, coxae orange. Abdomen dark, orange-brown, spaces between plates darker than plates; venter lighter gray. Total length 4.0 mm. Carapace 1.42 mm long, 1.26 wide in thoracic region, 1.29 wide in cephalic region. First femur 1.01 mm, patella and tibia 1.11, metatarsus 0.80, tarsus 0.44. Second patella and tibia 1.09 mm, third 0.73, fourth 0.97. Fourth femur 1.08 mm. Abdomen 3.2 mm long, 3.5 wide.

Male holotype. Lighter than female in color, dorsum of abdomen with some white anteriorly, dusky posteriorly. Second tibia thicker than first and slightly twisted, ventrally with indistinct, tiny macrosetae. Total length 2.9 mm. Carapace 1.19 mm long, 1.17 wide in thoracic region, 1.14 wide in cephalic region. First femur 0.91 mm, patella and tibia 1.05, metatarsus 0.79, tarsus 0.40. Second patella and tibia 0.93 mm, third 0.63, fourth 0.85. Fourth femur 0.99 mm.

Note. Males and females were collected at the same location.

Variation. Total length of females 3.1 to 4.0 mm.

Diagnosis. In *H. lamoka*, the depression of the epigynum (Fig. 38) is larger than in *H. lagoas* (Fig. 24), and the posterior view of the epigynum (Fig. 40) shows the rim of the anterior depression less distinctly than in *H. nasuta* (Fig. 46). The male of *H. lamoka* (Fig. 43) lacks the median projection of the carapace of *H. nasuta* (Fig. 49), and its palpus has a larger median apophysis (at 6 hr in Fig. 44) than that of *H. nasuta* (Fig. 51).

Paratypes. VENEZUELA *Distrito Federal*: Caracas, 4–25 July 1891, 1♀; Río Cacucho, Caracas, 9–21

July 1891, 1♀; La Moka, Caracas, Aug. 1891, 1♀ (all Meinert, ZMUC, one in MCZ).

Specimens Examined. VENEZUELA *Distrito Federal*: Caracas, 1♀ (V. Ben Khien, MNRJ).

Hypognatha nasuta

O. P.-Cambridge

Figures 45–51, 54, 55; Map 2B

Hypognatha nasuta O. P.-Cambridge, 1896: 222, pl. 27, figs. 3–5, ♀, ♂. Two female and one male syntypes from Teapa, Tabasco, Mexico, in BMNH no. 1905.4.28.3487–3496(part), examined. F. P.-Cambridge, 1904: 540, pl. 51, figs. 27, 28, ♀, ♂. Roewer, 1942: 894. Clickering, 1953: 6, figs. 11–15, ♀, ♂. Bonnet, 1957: 2258.

Description. Female from Veracruz State, Mexico. Carapace orange, lightest posteriorly. Chelicerae, endites, labium orange. Sternum dusky orange. Legs orange. Abdomen orange, with venter lighter than dorsum, some gray in middle of venter. Total length 3.7 mm. Carapace 1.58 mm long, 1.23 wide in thoracic region, 1.27 wide in cephalic region. First femur 1.01 mm, patella and tibia 1.14, metatarsus 0.83, tarsus 0.48. Second patella and tibia 1.08 mm, third 0.72, fourth 1.04. Fourth femur 1.1 mm. Abdomen 3.4 mm long, 3.5 wide.

Male holotype. Coloration as in female. Five minute macrosetae on right second tibia, two on left. Total length 2.5 mm. Carapace 1.18 mm long, 1.00 wide in thoracic region, 0.92 wide in cephalic region. First femur 0.83 mm, patella and tibia 1.02, metatarsus 0.70, tarsus 0.39. Second patella and tibia 0.92 mm, third 0.58, fourth 0.78. Fourth femur 0.79 mm (specimen from near La Palma). Abdomen 2.0 mm long, 2.0 wide.

Note. Males and females were collected together.

Variation. Total length of males 2.2 to 2.5. The illustrations were made from Veracruz State specimens.

Diagnosis. The female *H. nasuta* differs by having the anterior depression of the epigynum more distinct in posterior view (Fig. 46) than that of *H. lamoka* (Fig. 40). The male *H. nasuta* has a distinct, median, pointed annulate extension on the clypeus

(Fig. 49), absent from all other *Hypognathina* (Fig. 43).

Natural History. O. P. Cambridge (1896) reported in a note with the description that it had been found on open, wet ground, near a highland stream, in a coarse, slanting orb, 12 to 15 cm diameter, about 2.5 m above ground, supported by lines 1.5 m long, among trees 3 m apart, with the spider in the hub.

Specimens Examined. MEXICO *San Luis Potosí*: Tamazunchale, 18–20 July 1946, 1♂ (J. C., D. L. Pallister, AMNH). *Veraacruz*: Córdoba, 14 May 1946, 1♀ (J. C., D. L. Pallister, AMNH); Estación de Biología Tropical “Los Tuxtlas”, nr. La Palma, 18°36'N, 95°07'W, 29 June–1 July 1953, 1♂ (W. Maddison, MCZ).

Hypognatha scutata (Perty) Figures 56–63; Map 2A

Acrosoma scutatum Perty, 1833: 194, pl. 38, fig. 7. Specimens from Provincia Bahiensis, in ZSM, destroyed during the Second World War.

Gasteracantha Feisthameli Guérin-Méneville, 1840: 110. Specimen from Cayenne, French Guyana, in MNHN, not examined. First synonymized by Simon, 1895b: 871.

Eurysona scutatum:—C. L. Koch, 1839: 117, fig. 517, ♀. Keyserling, 1880: 293, pl. 4, fig. 1, ♀, ♂.

? *Micrathena squamosa* Simon, 1864: 293. Immature holotype, total length 1.5 mm, from Brazil, in MNHN, examined. Doubtful NEW SYNONYMY.

Calyndra prospiciens O. P.-Cambridge, 1874: 175, fig. 3, ♂. Male holotype from Minas Gerais, Brazil (H. Rogers), in HECO, examined. First placed in *Hypognatha* by Simon, 1895b. NEW SYNONYMY.

Paraplectana decora O. P.-Cambridge, 1877: 34, pl. 7, fig. 8, ♀. Female holotype from “Rio Grande, South America” (H. Rogers) [on a copy of holotype label: S. Brazil], in HECO, B 1160, examined. NEW SYNONYMY.

Hypophthalma coccinellina Taczanowski, 1879: 125, pl. 2, fig. 37, ♀. One female, 3 imm. syntypes from Amable María [Tarma Prov., Junín], Peru, in PAN, examined. NEW SYNONYMY.

Paraplectana scutata:—Keyserling, 1892: 2, pl. 1, fig. 2, ♀, ♂.

Hypognatha scutata:—Simon, 1895b: 871, 874, figs. 932–935, ♀, ♂. Roewer, 1942: 894. Bonnet, 1957: 2258.

Hypognatha squamosa:—Simon, 1895b: 874. Roewer, 1942: 894.

Hypognatha prospiciens:—Simon, 1895b: 872. Roewer, 1942: 893. Bonnet, 1957: 2258.

Hypognatha decora:—Simon, 1895b: 874. Roewer, 1942: 894. Bonnet, 1957: 2258.

? *Hypognatha cruciata* Tullgren, 1905: 36, pl. 5, fig.

13, imm. Immature holotype from Tatarenda, Chaco [Tatarenda, Tarija, 600 m, 21°50'S, 63°37'W (Payuter, 1992)], Bolivia, in NRMS, examined. Roewer, 1942: 893. Bonnet, 1957: 2258. Doubtful NEW SYNONYMY.

Hypognatha coccinellina:—Roewer, 1942: 893. Bonnet, 1957: 2258.

Hypognatha squamosa:—Bonnet, 1957: 2259.

Note. Neither Perty's description nor that of C. L. Koch is recognizable to species. The first time the name *scutata* was assigned to a species with adequate illustration was by Keyserling (1880, 1892). I am following Keyserling's use. Koch (1839) had examined Perty's specimen earlier in the Munich museum. Specimens from the BMNH, no. 15.3.5.1895.96, considered types of *Acrosoma scutata*, included a male and a female. Inside the vial was a 5-by-9-mm label with “Brasilien, E. Simon” in clear, clean handwriting and a larger, blue-bordered label, 20 by 26 mm, with a faint, large, barely visible “Eurysona scutata Pert.”. This specimen apparently moved from Paris to Keyserling and served for Keyserling's description of *Eurysona scutata* (1880). Keyserling (1880, 1892) cited only three localities: Cayenne, Neu Granada [Colombia], and Peru. He does not mention the locality for either *A. scutatum* (Bahia State, Brazil), or the specimen illustrated and labeled by C. L. Koch (Brazil).

The vial with the original specimens of *C. prospiciens* was labeled as *Mutina prospiciens*. According to I. Lansbury (personal communication, 1994), O. P.-Cambridge usually listed all material in a bottle on a single large label referring to each tube with a number. Thus, the labels that come with loaned specimens are all copied from the label in the jar.

Micrathena squamosa Simon was spelled with one *m* by Bonnet (1957: 2259). The name *squamosa* may be preoccupied by *Plectana squamosa* Walckenaer (1836: 202) [= *Micrathena sexspinosa* (Hahn)]. *Plectana*, with the type species *cancriformis*, is a synonym of *Gasteracantha* but originally contained many *Micrathena* descriptions. It was not possible

to place the immature holotype, so it is here placed in the most common, widespread species of *Hypognatha*.

The holotype of *H. cruciata* is also immature (total length about 3 mm); it is placed here with the most common species, as its distribution fits that of *H. scutata* (Map 2A).

Description. Female from Trinidad. Carapace, chelicerae, sternum, legs reddish brown. Abdomen reddish brown with venter lighter than dorsum. Total length 4.0 mm. Carapace 1.7 mm long, 1.5 wide in thoracic region, 1.7 wide in cephalic region. First femur 1.0 mm, patella and tibia 1.2, metatarsus 0.8, tarsus 0.5. Second patella and tibia 1.1 mm, third 0.8, fourth 1.1. Fourth femur 1.1 mm. Abdomen 2.9 mm long, 3.3 wide.

Male from Trinidad. Coloration as in female. Second tibia gently curved. Abdomen as in female. Total length 2.7 mm. Carapace 1.82 mm long, 1.43 wide in thoracic region, 1.37 wide in cephalic region. First femur 1.10 mm, patella and tibia 1.32, metatarsus 1.01, tarsus 0.53. Second patella and tibia 1.31 mm, third 0.79, fourth 1.09. Fourth femur 2.0 mm. Abdomen 2.5 mm long, 2.9 mm wide.

Note. Males and females were collected together.

Variation. Some individuals have symmetrical pairs of white patches. Total length of females 3.1 to 5.7 mm, but most females less than 4 mm, males 2.5 to 3.6, most males less than 3 mm. All illustrations were made from specimens from Trinidad.

Diagnosis. The female is separated from others by having posteriorly, in subventral view of the epigynum, two adjacent, light, colored circles (Fig. 57, at 12 hr in Fig. 58). The male is separated from

others by the sculpturing of the eye region (Fig. 61), the shape of the median apophysis (at 6 hr in Fig. 63), and the U-shaped portion of the terminal apophysis (at 11 hr in Fig. 63).

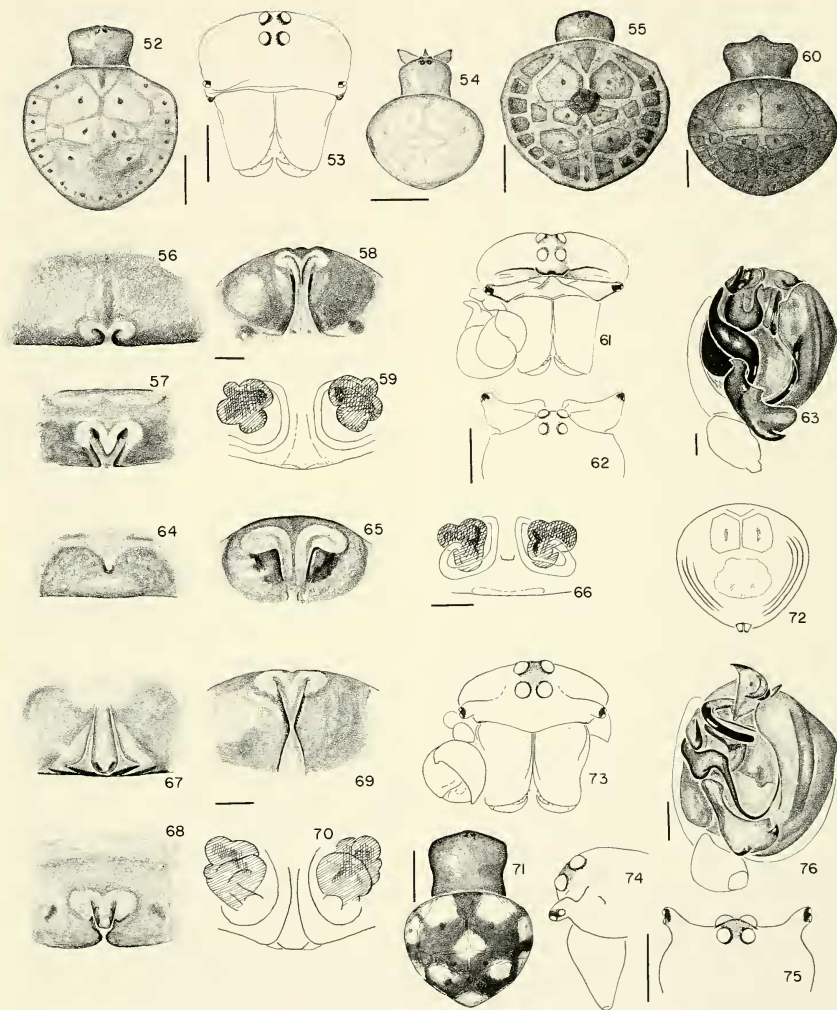
Natural History. Simon (1895a) wrote that the spider builds a regular orb web.

Specimens Examined. LESSER ANTILLES *Trinidad:* Arima, May 1953, 1♂ (N. L. H. Krauss, AMNH); 24–26 July 1978, 2♀ (D. A. Brady, AMNH); 6.4 km N Arima, 23 Aug. 1986, 1♀, 1 imm. (G. B. Edwards, FSCA); nr. Simla, 20–23 Aug. 1986, 3♀, 1♂, 1 imm. (G. B. Edwards, FSCA); Arima Valley, 10–22 Feb. 1964, 1♀, 1 imm. (J. Rozen, P. Wygodzinsky, AMNH); Simla, Arima Valley, Dec. 1954, 1♀, 2♂, 18 imm. (A. M. Nadler, AMNH); 23 Apr. 1964, 1♂ (A. M. Chickering, MCZ); 10 May 1981, 1♂, 2♀ (R. West, MCZ); Diego Martin, 9 Oct. 1944, 1♀ (R. H. Montgomery, AMNH); 23 Aug. 1963, 1♀ (E. N. K.-Waering, AMNH); Maracas Valley, 16 July, 1964, 1♀ (J. Lazell, MCZ); Mount Tucuche, April 1929, 5♀, 4♂, 2 imm. (P. J. Darlington, MCZ); Port of Spain, 1913, 19♀, 7♂, 58 imm., no date, 6♀, 6♂, 37 imm. (R. Thaxter, MCZ); Navy Base, SW Trinidad, Sept. 1944, 1♀, 1 imm.; Nov. 1944, 6♀ (R. Ingle, AMNH). SURINAM *Saramacca:* Voltzberg, 15 Dec. 1980, 1♀ (D. Smith, MCZ); Voltzberg-Raleghvallen Reserve, 4°45'N, 56°10'W, 4♀, 5 imm. (D. Smith, MCZ). *Marowijne:* Anapaiké village, Lawa River, 27–29 Nov. 1963, 1♀ (B. Malkin, AMNH). COLOMBIA *Meta:* Río Duda, Macarena, 450 m, 1992, 2♀ (R. Calisto, RC); 4.9 km W Villavicencio, 11 Mar. 1955, 3♀, 1♂, 14 imm. (E. I. Schlinger, E. S. Ross, CAS). EC-UADOR *Sucumbios:* Limoncocha, 24–26 June 1980, 1♀ (H. V. C. B. Weems, FSCA). *Napo:* 20 km E Puerto Napo, Alimahuí, 01°00'S, 77°25'W, Aug. 1994, 1♀ (V. D. Roth, CAS); Coca, Río Napo, May 1965, 1♀ (L. Peña, MCZ); Yusupijio, 520 m, 1°03'S, 72°48'W, 14 Aug. 1989, 1♀ (A. Bien, P. Ruby, MECN). PERU *Loreto:* Río Samiria, May 1990, 1♂ (D. Silva, MUSM). *Ucayali:* El Indio, Contamana, 8 Sept. 1986, 1♀ (P. Hocking, MUSM); 107 km E Tingo María, 16 Nov. 1954, 2♀ (E. I. Schlinger, E. S. Ross, CAS). *Junín:* Utcuyacu, Feb.–Apr. 1948, 15♀, 8♂, 25 imm. (F. Woytkowski, AMNH). *Madre de Dios:* Iberia, 30 Apr. 1947, 1♀ (J. C. Pallister, AMNH); Zona Reserva Tambopata, 48 km SW Puerto Maldonado, 12°50'S, 69°20'W, 1–4 May 1984, 1♀ (W. J. Pulawski, CAS); 12°50'S, 69°17'W, 16 Aug. 1986, 1♀ (I. Bohorquez, MUSM); 15 May 1988, 1♀,

Figures 52, 53. *Hypognatha mozamba* n. sp., female. 52, dorsal. 53, eye region and chelicerae.

Figures 54, 55. *H. nasuta* O. P.—Cambridge. 54, male, dorsal. 55, female, dorsal.

Figures 56–63. *H. scutata* (Perty). 56–60, female. 56–59, epigynum. 56, ventral. 57, ventroposterior. 58, posterior. 59, cleared. 60, dorsal. 61–63, male. 61, eye region, chelicerae and right palpus. 62, eye region, subdorsal. 63, left palpus.



Figures 64-66. *H. saut* n. sp., female epigynum. 64, ventral. 65, posterior. 66, cleared.

Figures 67-76. *H. navio* n. sp. 67-72, female. 67-70, epigynum. 67, ventral. 68, ventroposterior. 69, posterior. 70, cleared. 71, dorsal. 72, abdomen, ventral. 73-76, male. 73, eye region, chelicerae and right palpus. 74, eye region and chelicera, lateral. 75, eye region, subdorsal. 76, palpus.

Scale lines. 1.0 mm; eye regions 0.5 mm; genitalia 0.1 mm.

1♂, 4 imm. (D. Silva D., MUSM); 20 Sept. 1991, 6♀, 1 imm. (D. Silva D., MUSM); 15 km E Puerto Maldonado, 12°33'S, 69°03'W, 14 July 1989, 1♀ (D. Silva D., MUSM); Zona Reservada Pakitzta, 11°56'S, 71°17'W, 19 Oct. 1991, 3♀ (D. Silva D., MUSM). BRAZIL *Roraima*: Ilha de Maracá, 19–21 Mar. 1957, 3♀, 7 imm., 24 July 1957, 2♀, 2 imm. (A. A. Lise, INPA), 31 Jan.–14 Feb. 1992, 1♀, 1♂, 56 imm. (A. A. Lise, MCP 1883). *Pará*: Le Para [Belém], 8♀, 2 imm. (MNHN 2477); Belém, 1♀ (C. F. Baker, MCZ), Aug. 1971, 1♀ (M. E. Galiano, MACN); Belém, Fazenda Velha, July 1970, 4♀, 1 imm. (M. E. Galiano, MACN); Canindé, Rio Gurupi, 7–15 Apr. 1963, 14♀, 1 imm. (B. Malkin, AMNH), 7–26 Apr. 1963, 4♀, 1♂ (B. Malkin, MZSP 3304, 3360, 3385); 18 km W Canindé, Aldeia Coraci, 16–26 Apr. 1963, 3♀ (B. Malkin, AMNH); Jacareacanga, Dec. 1968, 1♀ (M. Alvarenga, AMNH); Santarém, 19♀, 26 imm. (BMNH). *Amazonas*: Boca do Sumaíma nr. Tefé, 17 Oct. 1992, 1♂ (S. H. Borges, MCN 23011a); Colosso Reserve, 50 km N Manaus, 24 Apr. 1989, 1♀ (H. Fowler, R. S. Vieira, E. Venticinque, MCZ); Reserva Flor. A. Ducke, Manaus, 26 Aug. 1992, 1♂ (J. Adis et al., INPA). *Rondônia*: Fazenda Rancho Grande, NE Cauculândia, 6–15 Dec. 1990, 1♀ (J. E. Eger, FSCA); 15–23 March 1991, 1♀ (F. W. Skillman, FSCA). *Maranhão*: 15 km S Imperatriz, 20 Feb. 1975, 1♀ (E. S. Ross, CAS). *Ceará*: Maranguape Mountains, 1♂ (Stanford Exped., MCZ). *Goias*: Fazenda Acéiro, Jataí, Oct. 1962, 7♀, 1♂ (Depto. Zool., MZSP 7568, 7921). *Espírito Santo*: Espírito Santo, 1♀ (USNM). *Mato Grosso*: Chapada de Guimaraes, 18 Nov. 1♀, 1 imm.; 1 Dec. 1983, 1♂ (both M. Hoffmann, MCN 11971, 11979); Chavantina, Nov. 1946, 2♀; Jan. 1947, 1♀, 17 Feb. 1947 (all H. Sick, MZSP 1236, 1244, 5045). *Mato Grosso do Sul*: Fazenda Beyou Flor, Três Lagoas, 17 Oct. 1964, 2♀ (K. Lenko, MZSP 5130); Três Lagoas, Oct. 1964, 1♀ (Exped. Depto. Zool., MZSP 3977). *São Paulo*: Itaquêrê, Nova Europa, 17 Dec. 1964, 1♀, 1♂ (K. Lenko, MZSP 4073). *Paraná*: Guaira, July 1949, 1♀ (H. Zimmermann, MZSP 9797). BOLIVIA *Cochabamba*: Yungas Chaparé, 1,900–2,800 m, 10–12 Dec. 1984, 1♀ (L. E. Peña, AMNH). *La Paz*: Cerro Uchumachi, 7 km S Coroico, 1,900 m, 16°15'S, 67°21'W, 24, 25 Nov. 1989, 2♀, 4♂ (J. Coddington et al., USNM); Yolosa, 6 Jan. 1991, P. Goloboff et al., AMNH). ARGENTINA *Misiones*: Arroyo El Central, Depto. San Antonio, Nov. 1970, 1♀ (M. E. Galiano, MACN); Cataratas de Iguazu, Aug. 1963, 1♂ (M. E. Galiano, MACN); Parque Nacional Iguazu, Jan. 1966, 1♂ (M. E. Galiano, MACN); Eldorado, Nov. 1970, 1♀ (M. E. Galiano, MACN); General Belgrano, Dec. 1972, 2♀ (M. E. Galiano, MACN).

Hypognatha saut new species

Figures 64–66; Map 2E

Holotype. Female holotype from Petit Saut, 05°07'N, 53°05'W, French Guyana, by beating vegetation above an umbrella, Oct. 1989 (E. Nance), in MCZ.

The specific name is a noun in apposition after the locality.

Description. Female holotype. Cephalothorax orange. Abdomen dusky orange, the border darkest gray. Total length 2.8 mm. Carapace 1.42 mm long, 1.22 wide in thoracic region, 1.23 wide in cephalic region. First femur 0.50 mm, patella and tibia 1.00, metatarsus 0.66, tarsus 0.36. Second patella and tibia 0.91 mm, third 0.65, fourth 0.97. Fourth femur 1.12 mm. Abdomen 2.7 mm long, 2.9 wide.

Diagnosis. *Hypognatha saut* differs from *H. scutata* by having a small, ventral notch with a sclerotized rim in the center of the epigynum (Fig. 64), absent in *H. scutata* (Fig. 56), and by having the light areas on the posterior of the epigynum (Fig. 65) larger than in *H. scutata* (Fig. 58).

Specimens Examined. No other specimens were found.

Hypognatha navio new species

Figures 67–76; Map 2E

Holotype. Male holotype and female paratype from Serra do Navio, Territ. Amapá, Brazil, 0°59'S, 52°03'W, June 1966 (M. E. Galiano), in MACN. The specific name is a noun in apposition after the locality.

Description. Female paratype. Carapace orange, cephalic region darkest. Chelicerae, endites, orange. Sternum dusky orange. Legs light orange. Dorsum of abdomen with a dozen white patches, less than their diameter apart (Fig. 71), venter gray. Eyes small. Total length 3.1 mm. Carapace 1.58 mm long, 1.40 wide in thoracic region, 1.53 wide in cephalic region. First femur 0.91 mm, patella and tibia 1.09, metatarsus 0.79, tarsus 0.48. Second patella and tibia 1.04 mm, third 0.71, fourth 1.09. Fourth femur 1.05 mm. Abdomen 2.5 mm long, 2.7 wide.

Male holotype. Carapace orange, thoracic area darkest. Abdomen light orange with white pigment around the periphery, venter light orange gray. Second femur without macroseta. Total length 2.7 mm. Carapace 1.30 mm long, 1.10 wide in tho-

racic region, 1.07 wide in cephalic region. First femur 0.75 mm, patella and tibia 0.99, metatarsus 0.65, tarsus 0.40. Second patella and tibia 0.91 mm, third 0.61, fourth 0.87. Fourth femur 0.78 mm. Abdomen 2.1 mm long, 2.4 wide.

Note. Male holotype and female paratype were collected together but may not belong together. A female of *H. mozamba* was also collected with the pair.

Diagnosis. The female epigynum (Figs. 67, 68) differs from that of *H. scutata* (Figs. 56, 57) by having a median, raised, scape-like structure. The male differs by the different shape of the eye region (Figs. 73–75), the shape of the median apophysis (at 6 hr in Fig. 76), and the coiled terminal apophysis (at 11 hr in Fig. 76).

Natural History. The specimen from Venezuela was collected by sweeping in humid forest.

Specimens Examined. VENEZUELA Bolívar: 40 km west of Santa Elena, 1,000 m el., 7 July 1987, 1♂ (S., J. Peck, AMNH).

Hypognatha testudinaria (Taczanowski)

Figures 77–87; Map 21

Hypophthalma geometrica Taczanowski, 1879: 126, pl. 2, fig. 38, ♀. Female lectotype, two female and four immature paralectotypes, here designated, from Pumamarca [Depto. Junín], Peru, in PAN, examined. NEW SYNONYMY.

Hypophthalma testudinaria Taczanowski, 1879: 128, pl. 2, fig. 39, ♀. Male lectotype here designated, and one immature female paralectotype from Palataypampa, one female paralectotype from Pumamarca [Depto. Junín], Peru, in PAN, examined.

Hypognatha geometrica:—Roewer, 1942: 893. Bonnet, 1957: 2258.

Hypognatha testudinaria:—Roewer, 1942: 894. Bonnet, 1957: 2259.

Note. Taczanowski described this species with two names. He had adult females and an immature male of *H. geometrica*. But he considered the immature male to be mature, describing the simple palp without sclerites as *H. geometrica*, and separated the second, *H. testudinaria*, because of the male's cephalic projections and elaborate palpi. Because males are much easier to determine than females, I

use the second name *testudinaria* for this species. [There is no page priority for names that were published together (ICZN, 1985, Art. 24a, 24A).]

Description. Female lectotype of *H. geometrica*. Carapace orange-brown, sides of thoracic region darkest, chelicerae, endites brown. Sternum dark brown. Legs brown. Abdomen white with a dark brown patch on each sclerite (Fig. 82), sides white, venter dark gray. Total length 3.8 mm. Carapace 1.65 mm long, 1.39 wide in thoracic region, 1.35 wide in cephalic region. First femur 1.07 mm, patella and tibia 1.28, metatarsus 1.01, tarsus 0.52. Second patella and tibia 1.18 mm, third 0.87, fourth 1.17. Fourth femur 1.26 mm (from similar-sized female from Utcuyacu). Abdomen 3.3 mm long, 3.4 wide.

Male lectotype of *H. testudinaria*. Cephalothorax orange, except labium and sternum dusky orange, legs light orange. Abdomen gray dorsally, darker gray ventrally. Venter of second femur with a pair of minute, short macrosetae. Second tibia thicker than first and its venter with six short macrosetae, all positioned at right angle to axis of femur. Total length 2.8 mm. Carapace 1.47 mm long, 1.25 wide in thoracic region, 1.08 wide in cephalic region. First femur 1.10 mm, patella and tibia 1.36, metatarsus 1.07, tarsus 0.47. Second patella and tibia 1.22 mm, third 0.82, fourth 0.97. Fourth femur 1.04 mm. Abdomen 2.5 mm long, 2.1 wide.

Note. Males and females were collected in the same locality.

Variation. Total length of females 3.4 to 4.1 mm. The color of the dorsum of the abdomen on one paralectotype is glossy, dark brown. The median soft area of the epigynum is variable in width (Figs. 77–80). The illustrations in Figures 77, 78, and 82 were made from the female lectotype, in Figures 79, 80, and 83 from a paralectotype of *H. geometrica*, and in Figures 84–87 from the lectotype of *H. testudinaria*.

Diagnosis. The epigynum of the female is indistinct, having a median, lightly scler-

otized band (Figs. 77–80), difficult to separate from that of other lightly sclerotized females of other species. The male has a median apophysis (Fig. 87) similar to that of *H. carpish* (Fig. 94) but has a large pointed, terminal apophysis (at 9 to 2.30 hr in Fig. 87), whereas that of the similar *H. carpish* has a truncate terminal apophysis (at 9 to 12 hr in Fig. 94).

Specimens Examined. PERU *Junin*: Utenyacu, 1,600–2,200 m, Mar. 1945, 3♀, 1 imm. (F. Woytkowski, AMNH).

***Hypognatha ituara* new species**
Figures 88–91; Map 2N

Holotype. Female holotype from Utiariti, Mato Grosso, Brazil, 8 Aug. 1961 (K. Lenko), in MZSP no. 3732. The specific name is an arbitrary combination of letters.

Description. Female paratype. Carapace orange, chelicerae, endites, labium, sternum orange. Legs orange. Abdomen orange-white with posterior having an indistinct darker patch (Fig. 91); venter orange-gray. Total length 3.4 mm. Carapace 1.51 mm long, 1.22 wide in thoracic region, 1.19 wide in cephalic region. First femur 1.08 mm, patella and tibia 1.12, metatarsus 0.78, tarsus 0.41. Second patella and tibia 1.00 mm, third 0.66, fourth 0.91. Fourth femur 0.96 mm. Abdomen 2.8 mm long, 2.9 wide.

Diagnosis. Unlike other species, *H. ituara* has the epigynum in ventral view (Fig. 88) with a posterior sclerotized margin, and in posterior view the sclerotized lateral plates leave between them a ventral, subtriangular depression (Fig. 89).

Specimens Examined. No other specimens were found.

***Hypognatha carpish* new species**
Figures 92–94; Map 2I

Holotype. Male holotype from west crest of Carpish Mountains, 40 mi [64 km] SW of Tingo María, Depto. Huánuco, Peru, 17 Oct. 1954 (E. I. Schlinger, E. S. Ross), in CAS. The specific name is a noun in apposition after the locality.

Note. Carpish Mountains could not be found on a map, but Carpish Pass was lo-

cated at 9°42'S, 76°09'W. The area above the pass is probably above 3,000 m in elevation.

Description. Male holotype. Carapace dark orange. Chelicerae, labium, endites orange. Sternum dusky orange. Legs light orange. Dorsum of abdomen light with indistinct darker patches; venter gray. Second tibia thicker than first and its venter has six short macrosetae. Total length 2.5 mm. Carapace 1.45 mm long, 1.26 wide in thoracic region, 1.09 wide in cephalic region. First femur 1.04 mm, patella and tibia 1.30, metatarsus 1.04, tarsus 0.49. Second patella and tibia 1.20 mm, third 0.73, fourth 1.00. Fourth femur 1.04 mm. Abdomen 2.5 long, 2.4 wide.

Diagnosis. This species is similar to *H. testudinaria* but differs by having the terminal apophysis truncate (at 9 to 12 hr in Fig. 94) and having a slight median protuberance on the clypeus (Figs. 92, 93).

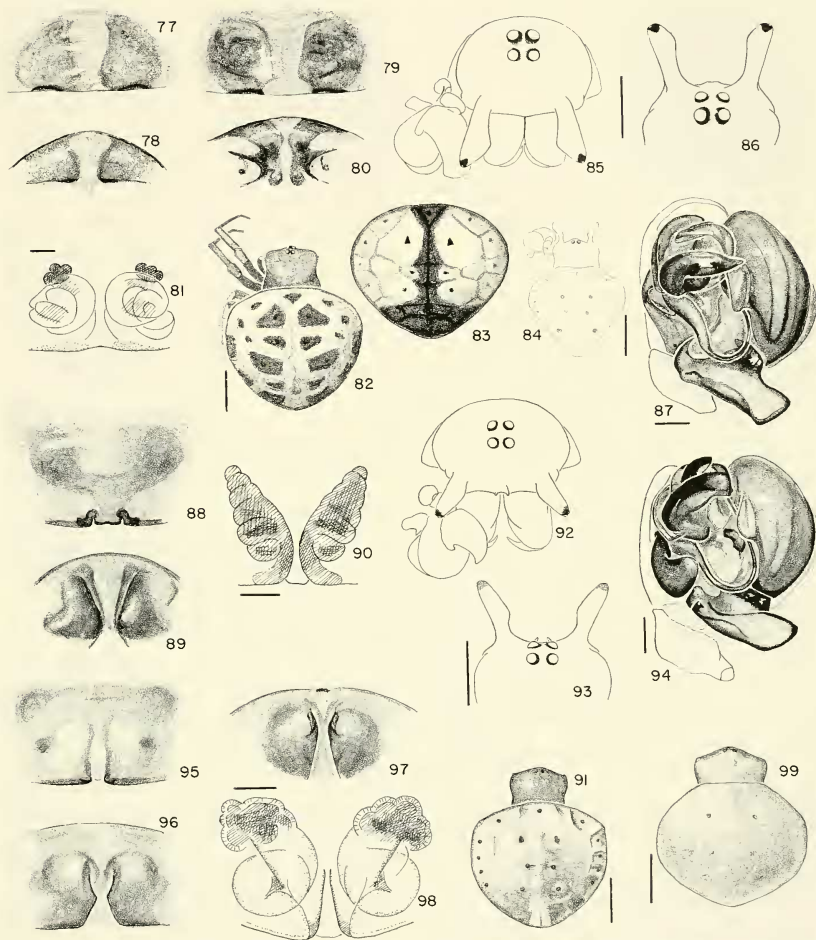
Specimens Examined. No other individuals were found.

Hypognatha mirandaribeiroi
(Soares and Camargo)
Figures 95–99; Map 2N

Hypognatha mirandaribeiroi Soares and Camargo, 1948: 371, figs. 25, 26, ♀. Female holotype from Chavantina, Est. Mato Grosso, Brazil, on the riverbank of Rio das Mortes, in MZSP no. 1237, examined. Brignoli, 1983: 271.

Description. Female holotype. Cephalothorax light orange, cephalic region, and chelicerae darkest. Sternum, legs lightest. Abdomen very light orange without marks, sclerites indistinct (Fig. 99) [the individual may have just molted]. Total length 3.3 mm. Carapace 1.61 mm long, 1.49 wide in thoracic region, 1.61 wide in cephalic region. First femur 1.01 mm, patella and tibia 1.30, metatarsus 0.91, tarsus 0.50. Second patella and tibia 1.22 mm, third 0.79, fourth 1.26. Fourth femur 1.17 mm. Abdomen 2.7 mm long, 3.1 wide.

Diagnosis. The epigynum (Fig. 95), as in *H. testudinaria*, has a median light sclerotized band, which, unlike *H. testudinaria*, has a pair of lateral plates in pos-



Figures 77-87. *Hypognatha testudinaria* (Taczanowski). 77-83, female. 77-81, epigynum. 77, 79, ventral. 78, 80, posterior. 81, cleared. 82, dorsal. 83, abdomen, dorsal. 77, 78, 82, (lectotype). 79, 80, 83, (paralectotype). 84-87, male. 84, dorsal. 85, eye region, chelicerae and right palpus. 86, eye region, subdorsal. 87, left palpus.

Figures 88-91. *H. ituara* n. sp., female. 88-90, epigynum. 88, ventral. 89, posterior. 90, cleared. 91, dorsal.

Figures 92-94. *H. carpish* n. sp., male. 92, eye region, chelicerae and right palpus. 93, eye region, subdorsal. 94, palpus.

Figures 95-99. *H. mirandaribeiroi* (Soares and Camargo), female. 95-98, epigynum. 95, ventral. 96, ventroposterior. 97, posterior. 98, cleared. 99, dorsal.

Scale lines. 1.0 mm; eye regions 0.5 mm; genitalia 0.1 mm.

terior view, leaving an hourglass-shaped depression between them (Fig. 97).

Specimens Examined. No other specimens were found.

***Hypognatha tingo* new species**
Figures 100–102; Map 2H

Holotype. Male holotype from 69 km east of Tingo María, Depto. Huánuco, Peru, 5 Oct. 1954 (E. I. Schlinger, E. S. Ross), in CAS. The specific name is a noun in apposition after the locality.

Description. Male holotype. Carapace, chelicerae, labium, endites orange. Sternum dusky orange. Legs light orange, femora dusky. Dorsum of abdomen dusky orange; venter gray. Second femur with three short, ventral macrosetae, two in proximal half, one in distal half. Second tibia thicker than first, with three ventral macrosetae on right, four on left, two in proximal half, others in distal half. Total length 2.9 mm. Carapace 1.39 mm long, 1.17 wide in thoracic region, 1.03 wide in cephalic region. First femur 0.91 mm, patella and tibia 1.14, metatarsus 0.97, tarsus 0.44. Second patella and tibia 1.09 mm, third 0.71, fourth 0.91. Fourth femur 0.94 mm. Abdomen 2.1 mm long, 2.1 mm wide.

Diagnosis. *Hypognatha tingo* differs from other males by having a "vertical" groove (at 4 hr in Fig. 102) in the median apophysis, and the terminal apophysis a thin, flat, truncate sclerite (at 12 hr in Fig. 102).

Specimens Examined. No other specimens were found.

***Hypognatha maria* new species**
Figures 103–105; Map 2H

Holotype. Male holotype from 69 km east of Tingo María, Depto. Huánuco, Peru, 12 Dec. 1954 (E. I. Schlinger, E. S. Ross), in poor physical condition, in CAS. The specific name is a noun in apposition after the locality.

Description. Male holotype. Cephalothorax orange, sternum with a dusky spot. Dorsum of abdomen dusky orange; venter gray. Second femur with three large, ventral, black macrosetae about equally spaced and at right angles to axis of article;

tibia with five small, ventral macrosetae; second tibia thicker than first. Total length 2.7 mm. Carapace 1.41 mm long, 1.22 wide in thoracic region, 1.01 wide in cephalic region. First femur 0.91 mm, patella and tibia 1.18, metatarsus 1.01, tarsus 0.44. Second patella and tibia 1.07 mm, third 0.70, fourth 0.91. Fourth femur 0.96 mm. Abdomen 2.2 long, 2.0 wide.

Diagnosis. *Hypognatha maria* is distinguished from other species by its median apophysis with three distal prongs (at 4 hr in Fig. 105) and the terminal apophysis with a bent, "vertical", sclerite (at 11 hr in Fig. 105).

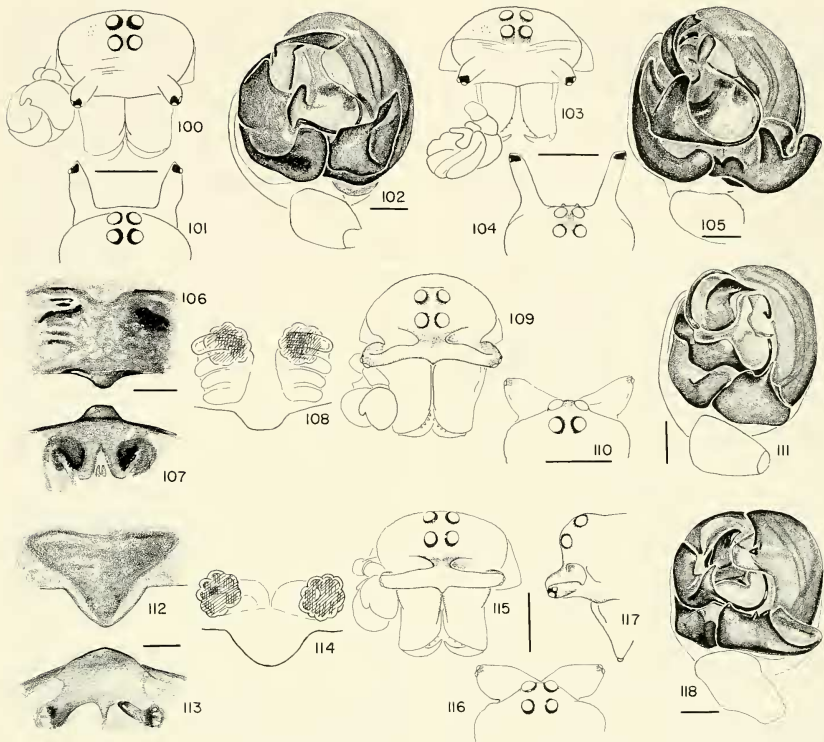
Specimens Examined. No other specimens were found.

***Hypognatha viamão* new species**
Figures 106–111; Map 2K

Holotype. Male holotype, one female and one immature paratypes from Capivari, Viamão, Rio Grande do Sul, Brazil, 4 Feb. 1977 (E. H. Buckup), in MCN no. 5688. The specific name is a noun in apposition after the locality.

Description. Female paratype. Cephalothorax orange-brown, sternum dusky, legs lightest. Abdomen reddish brown, white and gray, venter gray, sides of venter whitish. Chelicerae with five anterior teeth, four posterior. Total length 4.3 mm. Carapace 1.44 mm long, 1.19 wide in thoracic region, 1.17 wide in cephalic region. First femur 0.93 mm, patella and tibia 1.14, metatarsus 0.75, tarsus 0.39. Second patella and tibia 1.05 mm, third 0.70, fourth 1.00. Fourth femur 1.04 mm. Abdomen 2.9 mm long, 3.2 wide.

Male holotype. Coloration lighter than in female. No macrosetae on venter of second femur. First metatarsus, second tibia and metatarsus each with a lateral keel along its posterior side. Abdomen as in female. Total length 2.9 mm. Carapace 1.30 mm long, 1.05 wide in thoracic region, 0.93 wide in cephalic region. First femur 0.81 mm, patella and tibia 1.04, metatarsus 0.75, tarsus 0.38. Second patella and tibia 0.88 mm, third 0.58, fourth 0.78. Fourth



Figures 100-102. *Hypognatha tingo* n. sp., male. 100, eye region, chelicerae and right palpus. 101, eye region, subdorsal. 102, left palpus.

Figures 103-105. *H. maria* n. sp., male. 103, eye region, chelicerae and right palpus. 104, eye region, subdorsal. 105, palpus.

Figures 106-111. *H. viamao* n. sp. 106-108, epigynum. 106, ventral. 107, posterior. 108, cleared. 109-111, male. 109, eye region, chelicerae and right palpus. 110, eye region, subdorsal. 111, palpus.

Figures 112-118. *H. cambara* n. sp. 112-114, epigynum. 112, ventral. 113, posterior. 114, cleared. 115-118, male. 115, eye region, chelicerae and right palpus. 116, eye region, subdorsal. 117, eye region, chelicera, lateral. 118, palpus.

Scale lines. Eye regions 0.5 mm; genitalia 0.1 mm.

femur 0.87 mm. Abdomen 2.08 mm long, 2.01 wide.

Note. Males and females were collected together.

Variation. Total length of females 3.1 to 4.0 mm, males 2.2 to 3.1. The illustrations were made from the female paratype (MCN 5688) and from the male holotype.

Diagnosis. Females are separated from other species by having a slight median posterior lobe in ventral view of the epigynum (Fig. 106) and, in posterior view, two dark circles separated by about the diameter of a circle or less (Fig. 107). The male can be distinguished from those of other species by its small spine on the me-

dian apophysis just to the side of the embolus (at 5 hr in Fig. 111) and, on the terminal apophysis, a pointed sclerite in the shape of a bird's head (at 12 hr in Fig. 111).

Paratypes. BRAZIL *Rio Grande do Sul*: Viamão, 27 Mar. 1966, 1♂, 3 imm. (A. A. Lise, MCN 122); 29 Dec. 1976, 2♀, 1♂, 3 imm. (A. A. Lise, MCN 4960); 24 Jan. 1977, 1♂ (A. A. Lise, MCN 5148).

Specimens Examined. BRAZIL *São Paulo*: Cubatão, Sept. 1941, 1♀, 1 imm. (Soares, MZSP 11545); Fazenda Poço Grande, Juquiá: 21–26 July 1949, 1♀ (F. Lane, MZSP 11544); Represa Nova, São Bernardo, 12 Oct. 1941, 1♂ (F. Lane, MZSP). *Rio Grande do Sul*: Bom Jesus, 1 Apr. 1988, 1♂ (A. B. Bonaldo, MCN 17398); Alto dos Casemiros, Cachoeira do Sul, 25 Apr. 1993, 1♀ (R. G. Buss, MCP 3998); Campo Bom, 14 Apr. 1975, 1♀ (H. A. Gastral, M. H. Galileo, MCN 2865); Guaíba, 1 Jan. 1989, 1♂ (A. B. Bonaldo, MCN 18025); Montenegro, 11 Aug. 1977, 1♂ (A. A. Lise, MCN 6260); 29 Sept. 1977, 1♀, 1♂ (A. A. Lise, MCN 6661); 6 Oct. 1977, 1♀, 1♂, 1 imm. (H. Bischoff, E. H. Backup, MCN 6768, 6813); 3 Nov. 1977, 2♂, 2 imm. (M. E. L. Souza, MCN 7163); 1 Dec. 1977, 1♀ (E. H. Backup, MCN 7428); 15 Dec. 1977, 1♀, 1♂, 1 imm. (E. H. Backup, MCZ ex MCN 7559); Muçum, 2 Mar. 1984, 1♂ (A. D. Brescovit, MCN 12109); Novo Hamburgo, 14 Dec. 1984, 1♀ (C. J. Becker, MCN 12715); Pelotas, 10 May 1967, 1♀ (P. de Biasi, MZSP 10820); São Jerônimo, 20, 21 May 1982, 1♀ (D. E. Hennig, MCN 10380); Sertão de Santana, 26 Jan. 1977, 1♂ (E. H. Backup, MCN 5610); Triunfo, 19 May 1977, 1♂ (M. H. Galileo, MCN 5435); 23 July 1977, 1♂ (M. L. Tavares, MCN 5984); 27 Oct. 1977, 1♀ (E. H. Backup, MCN 7033); 12 May 1981, 1♂ (E. H. Backup, MCN 9649); 9 Dec. 1983, 1♀ (A. A. Lise, MCN 11278); 28 Nov. 1989, 1♂ (A. D. Brescovit, MCN 19037); 11 Sept. 1992, 1♂ (L. Moura, MCN 22345); 17 Oct. 1993, 1♀ (A. Francis Chini, MCN 23989); Aguas Belas, Viamão, 6 Jan. 1977, 2♀, 2 imm. (A. A. Lise, MCN 5896).

Hypognatha cambara new species

Figures 112–118; Map 2L

Holotype. Male holotype, female paratype from Itaímbézinho, Cambará do Sul, Rio Grande do Sul, Brazil, 18 May 1985 (A. A. Lise), MCN no. 13311.

The specific name is a noun in apposition after the locality.

Description. Female paratype. Cephalothorax orange-brown, legs lightest. Abdomen dusky brown and white, dark gray on venter, lighter around edge. Total length 3.8 mm. Carapace 1.62 mm long, 1.36 wide in thoracic region, 1.30 wide in cephalic region. First femur 1.04 mm, pa-

tella and tibia 1.24, metatarsus 0.87, tarsus 0.45. Second patella and tibia 1.15 mm, third 0.78, fourth 1.10. Fourth femur 1.14 mm. Abdomen 3.1 mm long, 3.2 wide.

Male holotype. Coloration as in female, but with more gray pigment on sternum. Second tibiae and metatarsi each with a sclerotized ridge along center of posterior face. Second tibia with three denticles in a median posterior line. Abdomen as in female. Total length 2.9 mm. Carapace 1.34 mm long, 1.24 wide in thoracic region, 1.11 wide in cephalic region. First femur 1.00 mm, patella and tibia 1.17, metatarsus 0.83, tarsus 0.39. Second patella and tibia 1.05 mm, third 0.66, fourth 0.96. Fourth femur 0.92 mm. Abdomen 2.3 mm long, 2.3 wide.

Note. Males and females were collected together.

Variation. Total length of females 3.2 to 3.8 mm, males 2.9 to 3.0. The illustrations were made from the female paratype, and the male from the holotype.

Diagnosis. Females are distinguished from *H. viamão* by their wider lobe of the posterior margin of the epigynum (Fig. 112) and a shallow depression in posterior view and the sclerotized edge with two lobes and two small dark spots (Fig. 113). The male has a longer median apophysis with a depression along its length (at 5 hr in Fig. 118).

Paratypes. BRAZIL *Rio Grande do Sul*: Itaímbézinho, Cambará do Sul, 16 June 1983, 1♀ (A. A. Lise, MCN 11726); 18 May 1985, 3♀ (A. A. Lise, MCN 13309, 16886).

Specimens Examined. BRAZIL *Rio Grande do Sul*: Bom Jesus, 1 Apr. 1988, 1♂ (A. B. Bonaldo, MCN 17399); Cambará do Sul, 11–13 Apr. 1994, 1♀ (L. A. Moura, MCN 25499).

Hypognatha matisia new species

Figures 119–127; Map 2J

Holotype. Male holotype, one female and two male paratypes from Pakitza, Rio Manu, 250 m, Depto. Madre de Dios, 12°07'S, 70°58'W, Peru, 22 Sept. 1988, from fogging *Matisia cordata* and *Hirtella triandria* trees (T. Erwin, B. D. Farrell), in MUSM, one male in USNM, one in MCZ. The specific name is a noun in apposition after the vegetation from which specimens were collected.

Description. Female paratype. Carapace brown, cephalic region orange. Chelicerae, endites, sternum orange-brown. Legs light orange. Abdomen, dorsally orange with anterior edge white, lines between plates black, and a brown patch on each large anterior plate (Fig. 122); venter gray. Abdomen with each anterior-lateral margin slightly concave (Fig. 122). Total length 3.1 mm. Carapace 1.51 mm long, 1.30 wide in thoracic region, 1.30 wide in cephalic region. First femur 1.00 mm, patella and tibia 1.18, metatarsus 0.91, tarsus 0.44. Second patella and tibia 1.09 mm, third 0.74, fourth 1.04. Fourth femur 1.10 mm. Abdomen 2.6 mm long, 3.1 wide.

Male holotype. Coloration as in female. Second femur with two macrosetae close together. Second tibia thicker than first with minute ventral tubercles. Total length 2.5 mm. Carapace 1.38 mm long, 1.09 wide in thoracic region, 0.95 wide in cephalic region. First femur 0.81 mm, patella and tibia 1.11, metatarsus 0.86, tarsus 0.40. Second patella and tibia 1.00 mm, third 0.65, fourth 0.86. Fourth femur 0.87 mm. Abdomen 2.1 mm long, 2.1 wide.

Note. Males and females were collected together.

Variation. Total length of females 3.2 to 4.1 mm. The illustrations were made from female paratypes and male holotype.

Diagnosis. This species has a bicolored carapace. Females can be distinguished from others by the sclerotized, median portion of the posterior margin of the epigynum in ventral view (Fig. 119) and by the sclerotized, wider than long, plate adjacent to two slightly sclerotized rings in posterior view (Fig. 120). The male, unlike others, has a cone-shaped, projecting median apophysis (at 5 hr in Fig. 126, Fig. 127) and a large, transverse, sclerotized terminal apophysis (at 11 hr in Fig. 126).

Paratypes. PERU *Madre de Dios*: Zona Reservada de Manu, Puesto de Vigilancia Pakitzta, 11°55'S, 71°18'W, 28 Sept. 1987, 1♀ (D. Silva D., J. Coddington, USNM), 2 Oct. 1987, 1♀ (D. Silva D., J. Coddington, USNM); 12 July 1992, 1♂ (D. Silva D., MUSM).

Specimens Examined. PERU *Madre de Dios*: Zona Reservada Tambopata, 290 m, 12°50'S, 69°17'W, 3 Mar. 1987, 1♀ (P. Lozada, P. USNM); 25 July 1987, 1♀ (D. Silva D., MUSM), 11 June–12 July 1988, 1♀ (D. Silva D., MUSM).

Hypognatha pereiroi new species Figures 128–130; Map 2N

Holotype. Female holotype from Utariti, Mato Grosso, Brazil, 25 Oct. 1966 (K. Lenko, F. S. Pereiro), in MZSP no. 605-4a. The species is named after one of the collectors.

Description. Female holotype. Carapace orange, thoracic region lightest, chelicerae orange. Endites, labium, sternum, light orange; sternum dusky. Legs light orange. Abdomen light orange. Abdomen swollen as in *H. triunfo* (Fig. 174). Total length 3.5 mm. Carapace 1.56 mm long, 1.27 wide in thoracic region, 1.23 wide in cephalic region. First femur 1.04 mm, patella and tibia 1.17, metatarsus 0.83, tarsus 0.42. Second patella and tibia 1.13 mm, third 0.78, fourth 1.01. Fourth femur 1.05 mm. Abdomen 3.4 mm long, 4.1 wide.

Diagnosis. The female is distinguished from others by the triangular notch of the posterior margin of the epigynum in ventral view (Fig. 128) and, in posterior view, by two adjacent grooves narrowing ventrally (at 6 hr in Fig. 129).

Specimens Examined. No other specimens were collected.

Hypognatha belem new species Figures 131–133; Map 2N

Holotype. Female holotype from Belém, Est. Pará, Brazil, in forest, July 1972 (D. G. McGrath), in MCN ex MCZ. The specific name is a noun in apposition after the locality.

Description. Female holotype. Carapace orange, cephalic region lightest, thoracic region dusky. Chelicerae, endites, sternum orange. Legs light orange, fourth with dusky line on venter. Abdomen whitish with dusky areas, venter gray. Fourth femur only slightly longer than first. Total length 3.0 mm. Carapace 1.56 mm long, 1.26 wide in thoracic region, 1.22 wide in cephalic region. First femur 0.94 mm, patella and tibia 1.09, metatarsus 0.81, tarsus

0.44. Second patella and tibia 1.01 mm, third 0.74, fourth 0.99. Fourth femur 1.04 mm. Abdomen 0.5 mm long, 0.6 wide.

Diagnosis. *Hypognatha belem* differs from *H. matisia* by having the total length of the posterior margin sclerotized in ventral view of the epigynum (Fig. 131) and, in posterior view, having a curved sclerotized area, and in lacking apparent openings (Fig. 132).

Specimens Examined. BRAZIL St. Antonio [? Santo Antônio, Amazonas State?], no date, 2♀, 4 imm. (USNM).

Hypognatha janauari new species

Figures 134–137; Map 2N

Holotype. Female holotype, female paratype from Canal de Janauari, nr. Manaus, Amazonas State, Brazil, 16, 17 June 1987 (H. Höfer), in INPA. The specific name is a noun in apposition after the locality.

Description. Female holotype. Carapace, chelicerae, endites, sternum, orange. Legs, including coxae, lighter orange. Abdomen dorsum whitish with indistinct dark median band, a dark line around margin and dark sclerotized spots in plates; venter gray without pigment. Total length 3.9 mm. Carapace 1.75 mm long, 1.47 wide in thoracic region, 1.44 wide in cephalic region. First femur 1.09 mm, patella and tibia 1.31, metatarsus 1.04, tarsus 0.48. Second patella and tibia 1.21 mm, third 0.85, fourth 1.23. Fourth femur 1.22 mm. Abdomen 3.3 mm long, 3.5 wide.

Variation. A paratype collected with the holotype has a narrower frame of the "spectacles" in posterior view of the epigynum.

Diagnosis. Unlike that of *H. matisia*, the ventral view of the epigynum has a transverse ridge (Fig. 134) and, in posterior view, larger, more sclerotized, "spectacles" (Fig. 136).

Specimens Examined. No other specimens were found.

Hypognatha elaborata Chickering

Figures 138–153; Map 2C

Hypognatha elaborata Chickering, 1953: 2, figs. 1–5, ♀, ♂. Male holotype from "Biological Area" on

specimen label, "Barro Colorado Island" in publication, Panama Canal Zone, in MCZ, examined. Brignoli, 1983: 271.

Description. Female from Barro Colorado Island. Carapace dark brown. Chelicerae, sternum, coxae, legs orange-brown. Dorsum of abdomen (Fig. 145); venter dusky orange. Abdomen sclerotized, pointed behind, straight to slightly dented anteriorly (Fig. 145). Total length 3.6 mm. Carapace 1.66 mm long, 1.39 wide in thoracic region, 1.39 wide in cephalic region. First femur 1.07 mm, patella and tibia 1.26, metatarsus 0.97, tarsus 0.44. Second patella and tibia 1.18 mm, third 0.81, fourth 1.17. Fourth femur 1.10 mm. Abdomen 3.7 mm long, 3.4 wide.

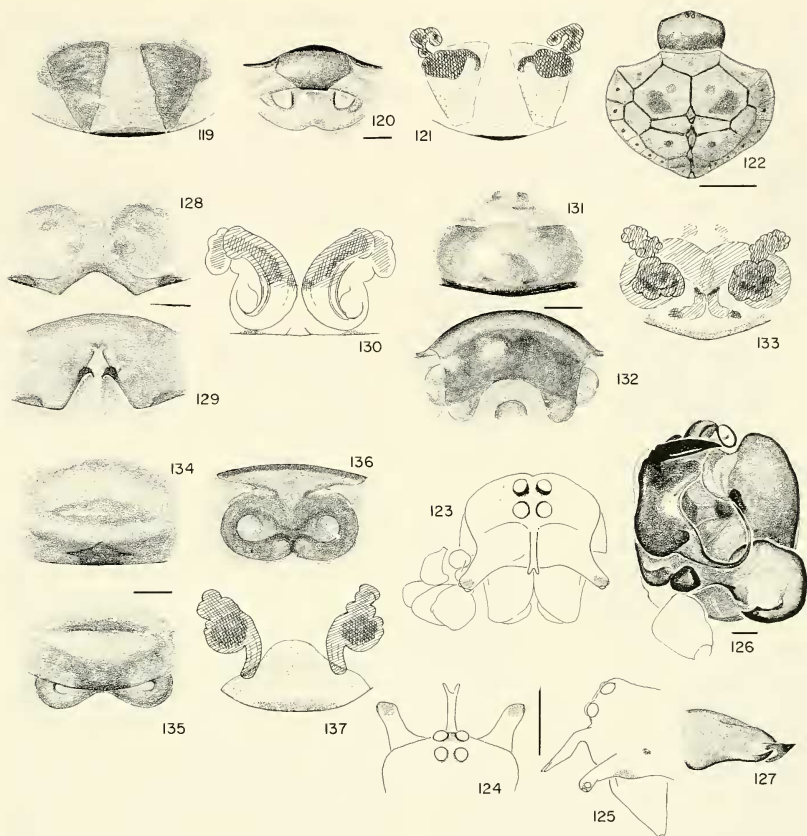
Male from Barro Colorado Island. Coloration lighter than female. Abdomen as in female (Fig. 149). Venter of second femur without macrosetae. Total length 2.7 mm. Carapace 1.43 mm long, 1.12 wide in thoracic region, 1.00 in cephalic region. First femur 1.01 mm, patella and tibia 1.30, metatarsus 1.09, tarsus 0.44. Second patella and tibia 1.15 mm, third 0.74, fourth 1.00 mm. Fourth femur 1.00 mm. Abdomen 2.3 mm long, 2.1 wide.

Note. Males and females were collected together.

Variation. Total length of females 3.1 to 3.9 mm, males 2.5 to 3.1. The duct of the vulva appears shorter in a female from Colombia than in the one illustrated (Fig. 144). The illustrations were made from several females and a male from Barro Colorado Island.

Diagnosis. The female is separated from others by the straight posterior margin of the epigynum (Fig. 142); when lifted up it shows a coil on each side of a median division (Fig. 143). The coil formed by the terminal apophysis of the male palpus is easy to see (at 11 to 1 hr in Figs. 150, 151, 153) and unlike that in any other species.

Natural History. Specimens were collected by C. E. Griswold at La Selva, Costa Rica, in successional vegetation, open vegetation, and cultivation, in understory



Figures 119–127. *Hypognatha matisia* n. sp., female. 119–121, epigynum. 119, ventral. 120, posterior. 121, cleared. 122, dorsal. 123–127, male. 123, eye region, chelicerae and right palpus. 124, eye region, subdorsal. 125, eye region, chelicera, lateral. 126, 127, left palpus. 126, ventral. 127, median apophysis, mesal.

Figures 128–130. *H. pereiroi* n. sp., epigynum. 128, ventral. 129, posterior. 130, cleared.

Figures 131–133. *H. belem* n. sp., epigynum. 131, ventral. 132, posterior. 133, cleared.

Figures 134–137. *H. janauari* n. sp., epigynum. 134, ventral. 135, ventroposterior. 136, posterior. 137, cleared.

Scale lines. 1.0 mm; eye regions 0.5 mm; genitalia 0.1 mm.

of secondary forest, and in understory of primary rain forest.

Specimens Examined. COSTA RICA Carillo [? in Guanacaste Prov. ?], 1♀ (N. Banks, MCZ). *Heredia:* El Plastico, 15 km S Puerto Viejo, 500 m, Feb. 1989,

1♀ (W. Eberhard, MCZ); La Selva nr. Puerto Viejo, 25 Mar. 1979, 1♂ (J. Coddington, MCZ); 5–20 Sept. 1981, 3♀, 1♂ (C. E. Griswold, CAS); Oct. 1981, 1♀ (C. E. Griswold, CAS); Feb. 1986, 1♀, 2♂, April 1986, 1♀, 2♂, June 1986, 1♀ (all W. Eberhard, MCZ). *Limón:* Bataan [Batán], 16 July 1956, 1♀ (N.

A. Weber, MCZ); Sixaola, 3, 4 Aug. 1981, 2♀, 3♂ (G. B. Edwards, FSCA). *Cartago*: Turrialba, 10–17 Apr., 15–30 May 1944, 2♀ (F. Schrader, AMNH). PANAMA *Chiriquí*: La Fortuna Dam Site, Sept. 1976, 1♀ (M. Robinson, MCZ). *Panamá*: nr. Gamboa, Sept. 1975, 1♀ (W. Eberhard, MCZ); Barro Colorado Island, July 1936, 1♀, Aug. 1950, 2♀, July 1954, 1♀, 2♂, 15 Aug. 1954, 1♀, May 1964, 1♀ (all A. M. Chickering, MCZ). COLOMBIA *Nariño*: La Planada, 1,800 m, 7 km S Choconés, July 1986, 2♀, 2 imm. (W. Eberhard, MCZ).

Hypognatha ica new species

Figures 154–161; Map 2H

Holotype. Male holotype, female paratype from Santo Antonio do Iça, Amazonas State, Brazil, 10 Feb. 1980 (J. M. Maia), in MCN no. 9017. The specific name is a noun in apposition after the locality.

Description. Female paratype. Carapace, chelicerae, endites, sternum orange. Legs light, dusky, orange. Abdomen gray and white, venter light orange-white, without pigment. Total length 3.7 mm. Carapace 1.69 mm long, 1.35 wide in thoracic region, 1.30 wide in cephalic region. First femur 1.04 mm, patella and tibia 1.24, metatarsus 1.01, tarsus 0.41. Second patella and tibia 1.17 mm, third 0.81, fourth 1.14. Fourth femur 1.06 mm. Abdomen 2.5 mm long, 3.1 wide.

Male holotype. Coloration as in female, but cephalic region of carapace lighter than thoracic and slightly dusky. Venter of second femur with about six small macrosetae. Total length 2.7 mm. Carapace 1.35 mm long, 1.06 wide in thoracic region, 0.93 wide in cephalic region. First femur 0.84 mm, patella and tibia 1.17, metatarsus 0.88, tarsus 0.44. Second patella and tibia 1.09 mm, third 0.71, fourth 0.89. Fourth

femur 0.88 mm. Abdomen 2.0 mm long, 2.1 wide.

Note. Males and females were collected together.

Diagnosis. In *H. ica*, unlike other species, the female's epigynum, in posterior view, has a pair of light, circular depressions, separated by a swollen area wider than the diameter of a depression (Fig. 155). The median apophysis of the male palpus has a distinctive shape, with a mesally pointing tooth in ventral view of the palpus (at 5 hr in Fig. 160) and in mesal view of the median apophysis two hooks, one facing forward, the other backward (Fig. 161).

Specimens Examined. BRAZIL *Amazonas*: Benjamin Constant, 22 Sept. 1962, 1♂ (K. Lenko, MZSP 3038).

Hypognatha coyo new species

Figures 162–164; Map 2C

Holotype. Female holotype from Centr. Hidroeléctrica Anchicaya, 400 m, Depto. Valle, Colombia [not dated, prob. 1970s] (W. Eberhard), in MCZ. The specific name is an arbitrary combination of letters.

Description. Female paratype. Carapace, chelicerae, endites, labium orange. Sternum dusky orange. Legs light orange. Abdomen with area between plates indistinctly white, shading out toward sides; six central dorsal plates enclosing orange circles; venter light dusky. Total length 3.1 mm. Carapace 1.40 mm long, 1.11 wide in thoracic region, 1.05 wide in cephalic region. First femur 0.85 mm, patella and tibia 1.03, metatarsus 0.76, tarsus 0.42. Second patella and tibia 0.97 mm, third 0.67, fourth 0.91. Fourth femur 0.95 mm. Abdomen 2.3 mm long, 2.7 wide.

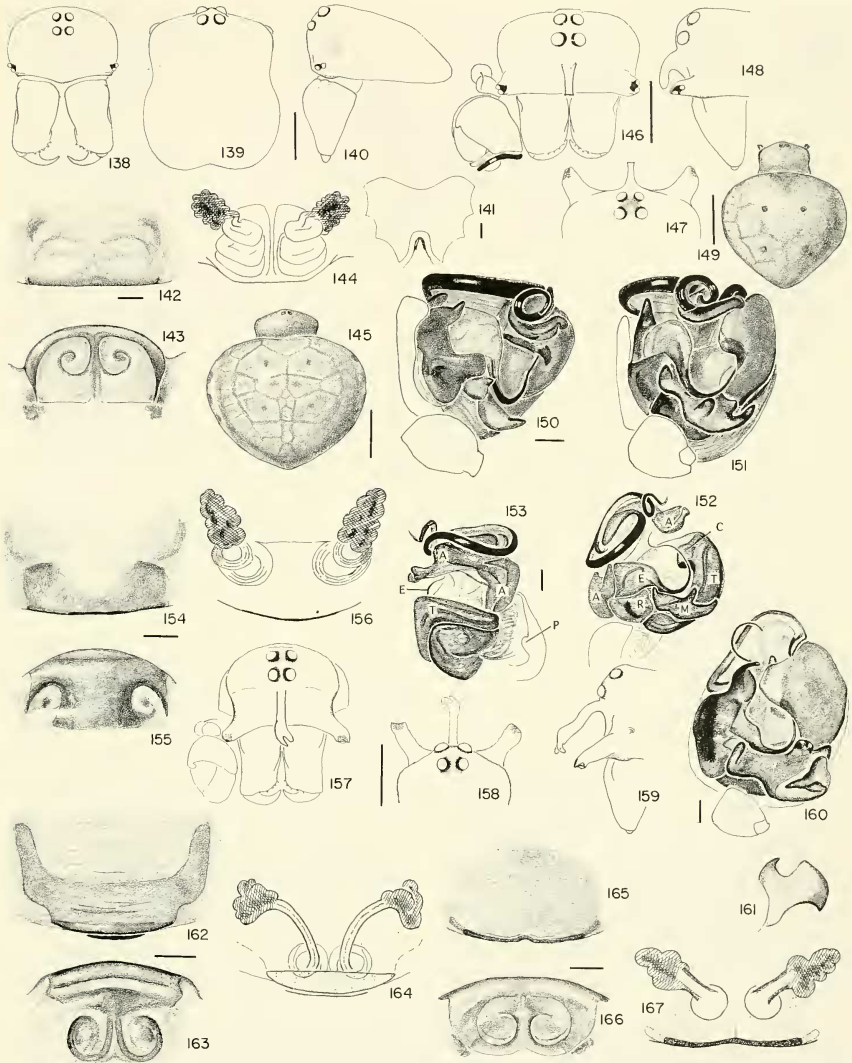
Diagnosis. *Hypognatha coyo* differs from others by the pair of looped ducts visible in posterior view of the epigynum (Fig. 163).

Figures 138–153. *Hypognatha elaborata* Chickering. 138–145, female. 138, eye region and chelicerae. 139, carapace. 140, carapace and chelicera, lateral. 141, sternum. 142–144, epigynum. 142, ventral. 143, posterior. 144, cleared. 145, dorsal. 146, 147, male. 146, eye region, chelicerae and right palpus. 147, eye region, subdorsal. 148, eye region, chelicera, lateral. 149 dorsal. 150–153, left palpus. 150, mesal. 151, ventral. 152, 153, pulled apart. 152, ventral. 153, dorsal.

Figures 154–161. *H. ica* n. sp. 154–156, epigynum. 154, ventral. 155, posterior. 156, cleared. 157–160, male. 157, eye region, chelicera and right palpus. 158, eye region, subdorsal. 159, eye region, chelicera, lateral. 160, 161, palpus. 160, ventral. 161, median apophysis, mesal.

Figures 162–164. *H. coyo* n. sp., epigynum. 162, ventral. 163, posterior. 164, cleared.

Figures 165–167. *H. maranon* n. sp., epigynum. 165, ventral. 166, posterior. 167, cleared.



Abbreviations. A, terminal apophysis. C, conductor. E, embolus. M, median apophysis. P, paracymbium. R, radix. T, tegulum.
Scale lines. 1.0 mm; eye regions 0.5 mm; Figure 146 and genitalia 0.1 mm.

Specimens Examined. No other specimens were found.

***Hypognatha maranon* new species**

Figures 165–167; Map 2I

Holotype. Female holotype from Río Alto Marañón [5°30'S, 78°33'W], betw. Río Cempa [?] and Río Nieva, [Depto. Amazonas], Peru, 10–24 Sept. 1924 (Klug) in AMNH. The specific name is a noun in apposition after the locality.

Description. Female holotype. Carapace, chelicerae, endites, sternum orange; cephalic region slightly lighter. Legs light orange. Abdomen orange underlaid by white pigment spots; venter dusky. Total length 3.2 mm. Carapace 1.49 mm long, 1.24 wide in thoracic region, 1.22 wide in cephalic region. First femur 0.93 mm, patella and tibia 1.18, metatarsus 0.91, tarsus 0.41. Second patella and tibia 1.05 mm, third 0.79, fourth 1.05. Fourth femur 1.10 mm. Abdomen 2.5 mm long, 3.1 wide.

Diagnosis. In *Hypognatha maranon*, the coil visible in posterior view of the epigynum (Fig. 166) coils from the dorsal, whereas in *H. elaborata* (Fig. 143) it coils from the venter.

Specimens Examined. PERU Loreto: Explorama Lodge, 80 km NE Iquitos, 12–19 Mar. 1988, 1♀ (J. E. Eger, FSCA).

***Hypognatha triunfo* new species**

Figures 168–170; Map 2M

Holotype. Female holotype from Triunfo, Rio Grande do Sul, Brazil, 12 May 1981 (Zanol), in MCN no. 9694. The specific name is a noun in apposition after the locality.

Description. Female holotype. Carapace, chelicerae, endites, sternum orange. Legs light orange. Abdomen light orange with dark areas between the sclerites and a black patch posteriorly on each side, venter dusky. The abdomen appears swollen

(as in *H. utari* [Fig. 174]). Total length 3.2 mm. Carapace 1.60 mm long, 1.14 wide in thoracic region, 1.26 wide in cephalic region. First femur 1.01 mm, patella and tibia 1.18, metatarsus 1.20, tarsus 0.41. Second patella and tibia 1.05 mm, third 0.68, fourth 0.96. Fourth femur 1.04 mm. Abdomen 2.5 mm long, 2.5 wide.

Diagnosis. The epigynum of *Hypognatha triunfo* (Fig. 169), like *H. utari*, has three lighter areas in posterior view (Fig. 172) but differs from *H. utari* by having a lobe on the posterior margin in ventral view of the epigynum (Fig. 168) and two dark patches on the posterior face (Fig. 169).

Paratypes. BRAZIL Rio Grande do Sul: Triunfo, 25 Jan. 1990, 1♀ (M. A. L. Marques, MCN 19383).

***Hypognatha utari* new species**

Figures 171–174; Map 2M

Holotype. Female holotype from Utiariti, Mato Grosso, Brazil, 25 Oct. 1966, one female paratype, 1–11 Nov. 1966 (K. Lenko, P. Pereiro), in MZSP, holotype no. 6054, paratype no. 3628. One paratype (6054) in MICZ ex MZSP. The specific name is an arbitrary combination of letters.

Description. Female holotype. Carapace orange, cephalic region lightest. Chelicerae, endites, sternum dark orange, sternum with some dusky spots. Legs light orange. Abdomen very light orange, venter light dusky. Total length 3.8 mm. Carapace 1.47 mm long, 1.21 wide in thoracic region, 1.20 wide in cephalic region. First femur 0.96 mm, patella and tibia 1.04, metatarsus 0.81, tarsus 0.44. Second patella and tibia 0.99 mm, third 0.75, fourth 1.07. Fourth femur 1.09 mm. Abdomen 2.9 mm long, 3.7 wide.

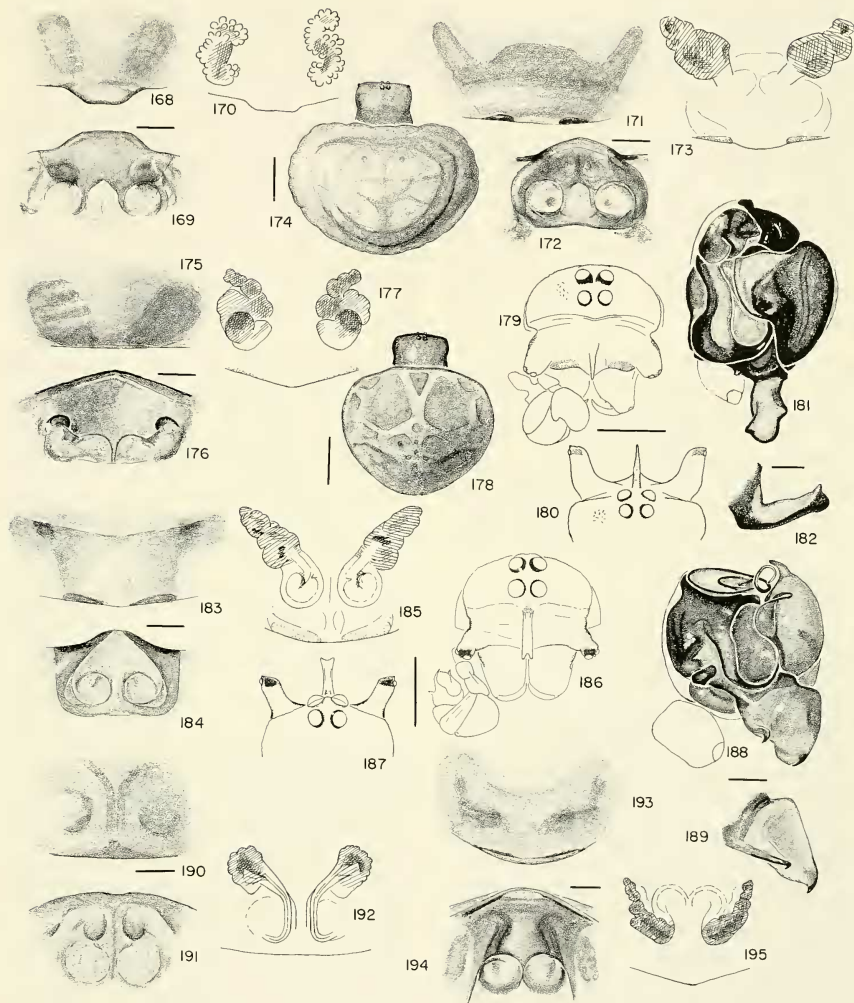
Variation. Total length of females 3.8 to 4.0 mm. All three specimens, including

Figures 168–170. *Hypognatha triunfo* n. sp., epigynum. 168, ventral. 169, posterior. 170, cleared.

Figures 171–174. *H. utari* n. sp., female. 171–173, epigynum. 171, ventral. 172, posterior. 173, cleared. 174, dorsal.

Figures 175–178. *H. alho* n. sp., female. 175–176, epigynum. 175, ventral. 176, posterior. 177, cleared. 178, dorsal.

Figures 179–182. *H. cacau* n. sp., male. 179, eye region, chelicerae and right palpus. 180, eye region, subdorsal. 181, 182, left palpus. 181, ventral. 182, median apophysis, mesal.



Figures 183-189. *H. divuca* n. sp. 183-185, epigynum. 183, ventral. 184, posterior. 185, cleared. 186-189, male. 186, eye region, chelicerae and right palpus. 187, eye region, subdorsal. 188, 189, left palpus. 188, ventral. 189, median apophysis, mesal.

Figures 190-192. *H. rancho* n. sp., epigynum. 190, ventral. 191, posterior. 192, cleared.

Figures 193-195. *H. solimoes* n. sp., epigynum. 193, ventral. 194, posterior. 195, cleared.

Scale lines. 1.0 mm; eye region 0.5 mm; genitalia 0.1 mm.

their epigyna, are very lightly sclerotized. The illustrations were made as a composite of all three females.

Diagnosis. *Hypognatha utari* differs from *H. triunfo* by having a straight posterior margin in ventral view of the epigynum, and the ventral, sclerotized area has a pair of projections, one on each side (Fig. 171). In posterior view (Fig. 172), the epigynum lacks the two dark patches present in *H. triunfo* (Fig. 169).

Natural History. The specimen from north of Xavantina came from cerrado scrub.

Specimens Examined. BRAZIL *Mato Grosso*: 260 km N Xavantina, 12°49'S, 31°46'W, 400 m, Feb.–Apr. 1969, 1♀ (Xavantina-Cachimbo Exped., MCZ).

Hypognatha alho new species

Figures 175–178; Map 2L

Holotype. Female holotype from Fazenda Pan d'Alho, Itú, Est. São Paulo, Brazil, 17 Dec. 1960 (F. Werner, U. Martins, Harm), in MZSP no. 7396. The specific name is a noun in apposition after the locality.

Description. Female holotype. Carapace dusky orange, thoracic region lightest. Chelicerae, endites, labium orange. Sternum dark dusky orange. Legs light dusky orange. Abdomen (Fig. 178) orange-brown with venter brownish. Total length 3.2 mm. Carapace 1.37 mm long, 1.16 wide in thoracic region, 1.13 wide in cephalic region. First femur 0.81 mm, patella and tibia 0.97, metatarsus 0.65, tarsus 0.39. Second patella and tibia 0.85 mm, third 0.62, fourth 0.91. Fourth femur 0.86 mm. Abdomen 2.9 mm long, 2.9 wide.

Variation. Total length of females 3.0 to 4.3 mm. The illustrations were made from the female holotype.

Diagnosis. In posterior view the epigynum is distinctly concave, and on each side is a small sickle-shaped dark spot (Fig. 176).

Specimens Examined. BRAZIL *Minas Gerais*: Serra do Caraça, 23–26 Nov. 1960, 1♀ (U. Martins, MZSP 7963). *Rio de Janeiro*: Rio de Janeiro, 1♀ (ZMUC); Teresópolis, 900–1,100 m, 7–9 Nov. 1945, 2♀, 6 imm. (H. Sick, AMNH). *São Paulo*: Ilha São Sebastião, 19 Jan. 1950, 1♀, uncertain determination

(H. Urban, MZSP 7697); Ilha da Cananéia, 5, 6 June 1976, 1♀ (L. R. Fontes, MZSP 13218).

Hypognatha cacau new species

Figures 179–182; Map 2G

Holotype. Male holotype from Fazenda Rancho Grande, northeast of Cacaullandia, Rondônia State, Brazil, 6–15 Dec. 1990, rainforest pantrap (G. B. Edwards), in FSCA. The specific name is a noun in apposition after the locality.

Description. Male holotype. Carapace, chelicerae, endites, labium, sternum dark orange. Legs dusky orange. Dorsum of abdomen dusky with darker dusky marks, including two curved median transverse bands; venter dusky. Body heavily sclerotized. Femora and tibiae without macrosetae. Total length 2.7 mm. Carapace 1.33 mm long, 1.07 wide in thoracic region, 0.99 wide in cephalic region. First femur 1.01 mm, patella and tibia 1.18, metatarsus 0.86, tarsus 0.43. Second patella and tibia 1.07 mm, third 0.65, fourth 0.87. Fourth femur 0.91 mm. Abdomen 2.1 mm long, 2.1 wide.

Diagnosis. The pointed median projection of the clypeus and the shape of the median apophysis (at 6 hr in Fig. 181), with a right angle in mesal view (Fig. 182), are diagnostic.

Specimens Examined. PERU *San Martín*: San Martín [nr. Juanjui (Pallister, 1956)], 15, 16 Dec. 1946, 1♂ (J. C. Pallister, AMNH).

Hypognatha divuca new species

Figures 183–189; Map 2G

Holotype. Male holotype, seven female and one male paratypes from Divisoria, 1,700 m, Depto. Huánuco [La Divisoria, Depto. Ucayali, 09°05'S, 75°46'W], Peru, 23 Sept.–3 Oct. 1946 (F. Woytkowski) in AMNH (one female in MCZ ex AMNH). The specific name is an arbitrary combination of letters.

Description. Female paratype. Carapace, chelicerae, dark orange. Endites, sternum orange. Legs orange, indistinctly ringed gray. Abdomen orange-white with sides on posterior gray, venter gray. Total length 3.1 mm. Carapace 1.63 mm long, 1.32 wide in thoracic region, 1.27 wide in cephalic region. First femur 1.01 mm, pa-

tella and tibia 1.18, metatarsus 0.88, tarsus 0.45. Second patella and tibia 1.14 mm, third 0.76, fourth 1.07. Fourth femur 1.04 mm. Abdomen 2.7 mm long, 2.9 wide.

Male holotype. Coloration as in female, but legs light orange, abdomen dusky orange. Second femur with a ventral, short macroseta at two-thirds its length. Second tibia slightly thinner than first. Total length 2.6 mm. Carapace 1.31 mm long, 1.10 wide in thoracic region, 0.96 wide in cephalic region. First femur 0.87 mm, patella and tibia 1.09, metatarsus 0.87, tarsus 0.44. Second patella and tibia 1.04 mm, third 0.68, fourth 0.91. Fourth femur 0.86 mm. Abdomen 2.1 mm long, 2.2 wide.

Note. Males and females were collected together.

Variation. The illustrations were made from female paratypes and from the male holotype.

Diagnosis. In ventral view the female has a pair of sclerotized thickenings on the posterior margin of the epigynum (Fig. 183) and, in posterior view, a triangular depression containing two posterior circles (Fig. 184). The palpus has a terminal apophysis with a coiled thread, like that of *H. elaborata*, but *H. divuca* differs by having a conical median apophysis (at 5 hr in Fig. 188, Fig. 189).

Specimens Examined. PERU *Pasco*: Huancabá, Quebrada Castillo, NW Iscozacin, 345 m, 10°10'S, 75°15'W, 6 Sept. 1987, 2♂ (D. Silva D., MUSM).

Hypognatha rancho new species

Figures 190–192; Map 2J

Holotype. Female holotype from Rancho Grande nr. Maracay [Est. Aragua], Venezuela, 15–31 Mar. 1946 (W. Beebe and others), in AMNH. The specific name is a noun in apposition after the locality.

Description. Female holotype. Cephalothorax orange. Abdomen dusky, dark orange without pattern; venter dusky. Posterior median eyes 1.4 diameters of anterior medians, laterals 0.9 diameter. Anterior median eyes 1.1 diameters apart. Posterior median eyes 1.1 diameters apart. Ocular trapezoid wider behind than in front. Height of clypeus equals 4 diame-

ters of anterior median eye. Total length 3.0 mm. Carapace 1.56 mm long, 1.30 wide in thoracic region, 1.26 wide in cephalic region. First femur 0.93 mm, patella and tibia 1.18, metatarsus 0.81, tarsus 0.45. Second patella and tibia 1.09 mm, third 0.77, fourth 0.97. Fourth femur 1.02 mm. Abdomen 2.5 mm long, 2.5 wide.

Diagnosis. In ventral view, the epigynum has a median, Y-shaped shadow (Fig. 190); in posterior view, the epigynum is lightly sclerotized, with a pair of openings behind scale-shaped darker areas (Fig. 191).

Specimens Examined. No other specimens were found.

Hypognatha solimoes new species

Figures 193–195; Map 2D

Holotype. Female holotype from Alto Solimões, Amazonas State [nr. Benjamin Constant (Lise, personal communication)], Brazil, Dec. 1979 (A. A. Lise), in MCN no. 8596. The specific name is a noun in apposition after the locality.

Description. Female holotype. Carapace orange, chelicerae dark orange. Sternum dusky orange. Legs light orange. Abdomen light orange with small white pigment spots on dorsum, venter dusky. Total length 2.8 mm. Carapace 1.53 mm long, 1.29 wide in thoracic region, 1.18 wide in cephalic region. First femur 0.96 mm, patella and tibia 1.18, metatarsus 0.87, tarsus 0.47. Second patella and tibia 1.14 mm, third 0.79, fourth 1.10. Fourth femur 1.08 mm. Abdomen 2.4 mm long, 2.7 wide.

Diagnosis. In *Hypognatha solimoes*, the posterior view of the epigynum (Fig. 194) has two circles dorsal to a sclerotized rectangle containing shadows of paired up-side-down J-shaped structures.

Specimens Examined. No other specimens were found.

Hypognatha deplanata (Taczanowski)

Figures 196–207; Map 2J

Hypophthalmia deplanata Taczanowski, 1873: 284, pl. 6, fig. 32, ♀. Female holotype from Cayenne, French Guyana, in PAN, examined.

Hypognatha deplanata:—Roewer, 1942: 593. Bonnet, 1957: 2258.

Description. Female holotype. Carapace, chelicerae orange. Endites, labium, sternum dusky orange-brown. Legs light dusky orange. Abdomen brown, anterior lateral corner white (Fig. 198); venter gray without marks, edge white. Total length 3.3 mm. Carapace 1.34 mm long, 1.22 wide in thoracic region, 1.14 wide in cephalic region. First femur 0.91 mm, patella and tibia 1.08, metatarsus 0.81, tarsus 0.47. Second patella and tibia 0.99 mm, third 0.76, fourth 0.97. Abdomen 2.4 mm long, 2.8 wide.

Male from Roraima. Coloration as in female, legs with broad darker rings. Posterior median eyes 1 diameter of anterior medians, laterals 0.6 diameter. Second femur with a short, ventral tooth, distally at about two-thirds of its length. Total length 3.0 mm. Carapace 1.45 mm long, 1.20 wide in thoracic region, 1.07 wide in cephalic region. First femur 1.01 mm, patella and tibia 1.26, metatarsus 1.01, tarsus 0.47. Second patella and tibia 1.13 mm, third 0.72, fourth 1.01. Fourth femur 1.03. Abdomen 2.1 mm long, 2.6 wide.

Note. Males and females were collected together.

Variation. Total length of females 3.3 to 4.0 mm, males 2.9 to 3.1. Figures 196–198 were made from the female holotype, and Figures 199–207 from specimens from Roraima. Because only one specimen, the holotype, was available from the Guianas, there is some uncertainty as to whether or not all specimens belong to one species.

Diagnosis. The diagnostic feature of females is the median hump on the ventral face of the epigynum (Figures 196, 197, 199–201) and in posterior view a pair of dark, indistinct circles (Figures 197, 201). The male differs from others by the large trilobed median apophysis (at 4 to 5 hr in Fig. 206, Fig. 207) and the small circle, part of the terminal apophysis (at 11 hr in Fig. 206).

Specimens Examined. BRAZIL *Roraima:* Ilha de Maracá, Rio Uraricoera, 17–25 Mar. 1987, 4♀, 2♂, 16 imm. (A. A. Lise, INPA, MCN 25375, 25378); 17–25 July 1987, 6♀, 5 imm. (A. A. Lise, INPA, MCN

25377, 25380, 25381); 18–22 Aug. 1987, 3♀, 2 imm. (R. Gribel, MCN 25676, MCZ); 5–10 Dec. 1987, 2♀, 1♂, 4 imm. (E. H. Buckup, A. A. Lise, INPA, MCN 25379). *Amazonas:* Km 62 Rodovia, Manaus, Caracará, 18 July 1977, 1♀ (J. Grazia, MCN 9477).

Hypognatha putumayo new species
Figures 208–215; Map 2G

Holotype. Male holotype, one male and one female paratypes from Buena Vista, Depto. Putumayo, Colombia, 23–29 July 1972 (W. Eberhard) in MCZ. The specific name is a noun in apposition after the locality.

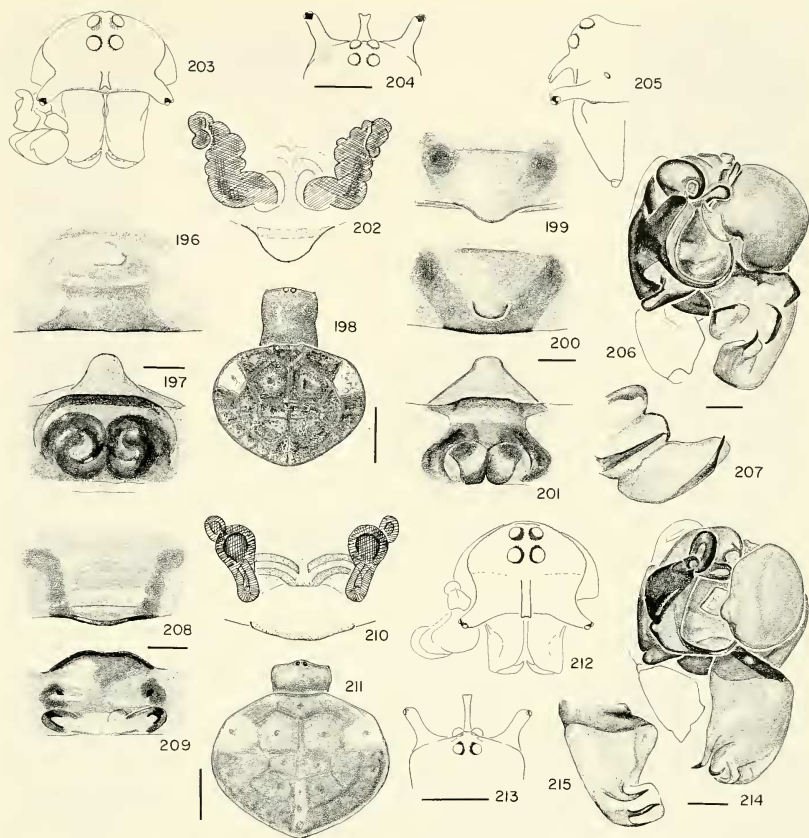
Description. Female paratype from Colombia. Carapace, chelicerae, orange-brown with a transverse darker band between cephalic and thoracic regions. Chelicerae, sternum orange-brown, sternum dusky. Legs orange. Abdomen reddish brown with some symmetrical white patches (Fig. 211), venter dark gray. Total length 3.5 mm. Carapace 1.59 mm long, 1.36 wide in thoracic region, 1.22 wide in cephalic region. First femur 1.04 mm, patella and tibia 1.18, metatarsus 0.91, tarsus 0.41. Second patella and tibia 1.11 mm, third 0.78, fourth 1.09. Fourth femur 1.09. Abdomen 2.9 mm long, 3.5 wide.

Male from Colombia. Coloration as in female. Second tibia thicker than first, proximal end of second femur with short, distal prolateral, macroseta. Total length 2.4 mm. Carapace 1.30 mm long, 1.05 wide in thoracic region, 0.91 wide in cephalic region. First femur 0.84 mm, patella and tibia 1.12, metatarsus 0.87, tarsus 0.41. Second patella and tibia 1.02 mm, third 0.65, fourth 0.90. Fourth femur 0.91 mm. Abdomen 2.1 mm long, 2.2 wide.

Note. Males and females were collected together.

Variation. Total length of females 3.1 to 3.6 mm, males 2.4 to 2.8. The illustrations were made from specimens from Colombia.

Diagnosis. The female can be separated from others by the two straight shadows of ducts, bent at their anterior ends, on the ventral surface of the epigynum (Fig. 208); in posterior view, there are no circles but two indistinct brackets. The male can be



Figures 196–207. *Hypognatha deplanata* (Taczanowski). 196–201, female. 196, 197, 199–202, epigynum. 196, 199, ventral. 198, dorsal. 200, ventroposterior. 197, 201, posterior. 202, cleared. 196–198, (holotype). 199–202, (from Roraimo State). 203–207, male. 203, eye region, chelicerae and right palpus. 204, eye region, subdorsal. 205, eye region, chelicera, lateral. 206, 207, left palpus. 206, ventral. 207, median apophysis, mesal.

Figures 208–215. *H. putumayo* n. sp. 208–211, female. 208–211, epigynum. 208, ventral. 209, posterior. 210, cleared. 211, dorsal. 212–215, male. 212, eye region, chelicerae and right palpus. 213, eye region, subdorsal. 214, 215, palpus. 214, ventral. 215, median apophysis, mesal.

Scale lines. 1.0 mm; eye regions 0.5 mm; genitalia 0.1 mm.

separated from others by the large median apophysis (at 5 hr in Fig. 214), cone-shaped with a distal flap in mesal view (Fig. 215).

Natural History. Specimens have been

found on trail through forest in Sucumbíos.

Specimens Examined. ECUADOR Sucumbíos: Reserva Faunística Cuyabeno, Laguna Grande, 00°00',

76°10'W, 25–29 June 1988, 2♀, 1 imm., 31 July–5 Aug. 1988, 6♀, 2 imm. (W. Maddison, MCZ).

Hypognatha colosso new species

Figures 17–19, 216–224;
Map 2J

Holotype. Male holotype from Reserva Colosso, 80 km north of Manaus, Amazonas State, Brazil, 20 Sept. 1989 (H. G. Fowler, E. Venticinque, R. S. Vieira), in MCN. The specific name is a noun in apposition after the locality.

Description. Female from near Tefé. Carapace orange, cephalic region lightest. Chelicerae, endites orange, sternum dusky, orange-brown. Legs light orange, except first, second, and fourth femora gray, all tarsi gray to black. Abdomen maculated white with brown, venter light gray. Total length 3.0 mm. Carapace 1.47 mm long, 1.25 wide in thoracic region, 1.16 wide in cephalic region. First femur 0.92 mm, patella and tibia 1.09, metatarsus 0.93, tarsus 0.39. Second patella and tibia 1.05 mm, third 0.72, fourth 1.01. Fourth femur 1.05 mm. Abdomen 2.5 mm long, 2.7 wide.

Male holotype. Cephalothorax orange, legs lightest. Abdomen dorsally with white pigment spots, almost no gray, venter light gray. Second femur with distal short, ventral macroseta, tibia with six small ones. Total length 2.5 mm. Carapace 1.23 mm long, 1.10 wide in thoracic region, 0.86 wide in cephalic region. First femur 0.92 mm, patella and tibia 1.11, metatarsus 0.81, tarsus 0.42. Second patella and tibia 1.04 mm, third 0.62, fourth 0.91. Fourth femur 0.92 mm. Abdomen 2.1 mm long, 2.2 wide.

Note. Males and females were collected together.

Variation. Total length of females 3.0 to 3.8 mm. The illustrations were made from a female from Tefé and from the male holotype. Between the holotype and specimens from near Tefé are some minor differences in the shape of the palpal sclerites.

Diagnosis. The venter of the female epigynum has a diagnostic transverse ridge, best seen in ventroposterior view

(Fig. 217); the male's median apophysis is distally bulkier than that of similar species.

Specimens Examined. BRAZIL, Amazonas: Boca do Sumaúma, nr. Tefé, 17 Oct. 1992, 2♀, 1♂ (S. H. Borges, MCN 22970, 23011). Mato Grosso: Sinop, Feb. 1976, 2♀ (O. Roppa, AMNH).

Hypognatha furcifera (O. P.-Cambridge)

Figures 225–228

Mutina furcifera O. P.-Cambridge, 1881: 771, pl. 56, fig. 4, ♂. Male from the Amazon (Traill), in HECO, examined.

Hypognatha furcifera:—Simon, 1895a: 871, figs. 936, 937, ♂. Bonnet, 1957: 2258. Roewer, 1942: 893.

Description. Male holotype. Carapace, cephalic region, thoracic region, chelicerae, endites, sternum orange. Legs light orange. Abdomen orange-white without pigment dorsally, venter light dusky. Second femur with a short, distal, ventral, macroseta. Total length 2.7 mm. Carapace 1.30 mm long, 1.09 wide in thoracic region, 0.91 wide in cephalic region. First femur 0.90 mm, patella and tibia 1.17, metatarsus 0.76, tarsus 0.40. Second patella and tibia 1.06 mm, third 0.61, fourth 0.87. Abdomen 2.2 mm long, 2.3 wide.

Diagnosis. *Hypognatha furcifera* differs from other *Hypognatha* species by having a large median apophysis with four lobes (M in Fig. 227, Fig. 228) and a terminal apophysis resembling an embolus, pointing in the opposite direction and sitting within the embolus loop (Fig. 228).

Distribution. Unfortunately it is not known where in the Amazon area the specimen was collected.

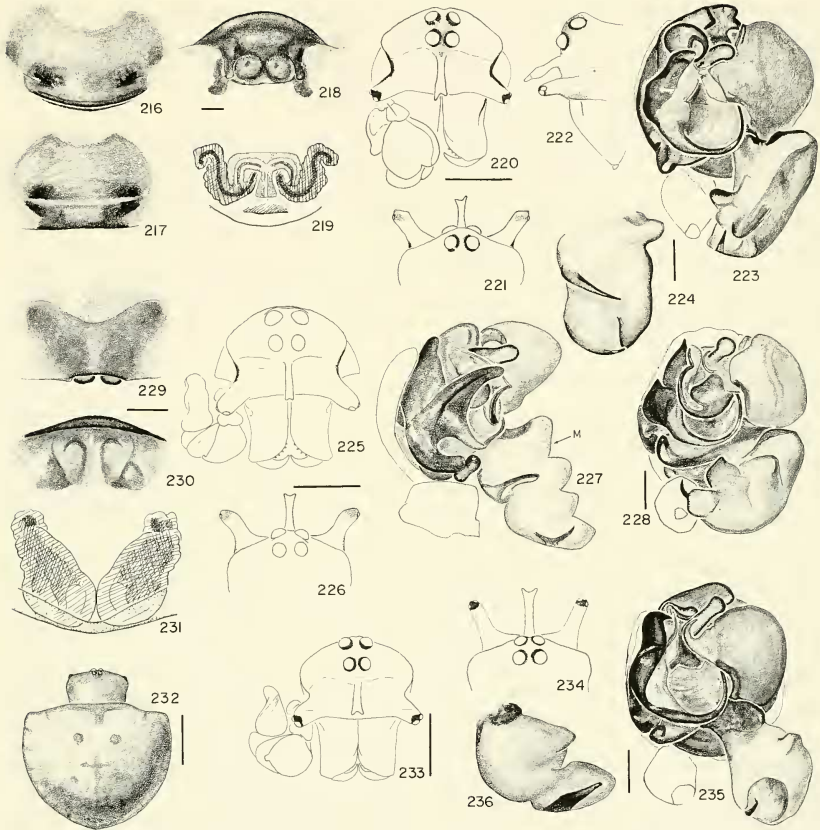
Specimens Examined. No other specimens were found.

Hypognatha tocantins new species

Figures 229–232; Map 2L

Holotype. Female holotype from Porto Nacional, Tocantins State, Brazil, 10–13 Nov. 1992 (L. Moura), in MCN no. 22628. The specific name is a noun in apposition after the locality.

Description. Female holotype. Cephalothorax orange. Chelicerae and sternum darkest. Abdomen orange with tiny white spots covering dorsum, venter dusky. Ab-



Figures 216–224. *Hypognatha colosso* n. sp. 216–219, epigynum. 216, ventral. 217, ventroposterior. 218, posterior. 219, cleared. 220–224, male. 220, eye region, chelicerae and right palpus. 221, eye region, subdorsal. 222, eye region, chelicera, lateral. 223, 224, left palpus. 223, ventral. 224, median apophysis, ventral.

Figures 225–228. *H. furcifera* (O. P.-Cambridge), male. 225, eye region, chelicerae and right palpus. 226, eye region, subdorsal. 227, 228, palpus. 227, mesal. 228, ventral.

Figures 229–232. *H. tocantins* n. sp., female. 229–231, epigynum. 229, ventral. 230, posterior. 231, cleared. 232, dorsal.

Figures 233–236. *H. jacaze* n. sp., male. 233, eye region, chelicerae and right palpus. 234, eye region, subdorsal. 235, 236, palpus. 235, ventral. 236, median apophysis, mesal.

Abbreviations. M, median apophysis.

Scale lines. 1.0 mm; eye regions 0.5 mm; genitalia 0.1 mm.

domen with anterior lateral angles (Fig. 232). Total length 3.3 mm. Carapace 1.45 mm long, 1.17 wide in thoracic region, 1.17 wide in cephalic region. First femur 1.00 mm, patella and tibia 1.17, metatarsus 0.78, tarsus 0.41. Second patella and tibia 1.04 mm, third 0.69, fourth 0.97. Fourth femur 1.01. Abdomen 2.7 mm long, 2.9 wide.

Diagnosis. In ventral view, the epigynum is covered by a sclerite with a pair of short, anteriolateral extensions (Fig. 229), and in posterior view the lightly sclerotized median area contains the shadows of two upside-down J-shaped lines (Fig. 230).

Specimens Examined. No other specimens were found.

Hypognatha jacaze new species Figures 233–236; Map 2J

Holotype. Male holotype from Jacazeranga [? Jacaréacanga, 06°16'S, 57°39'W, Paynter, 1991], Pará State, Brazil, Oct. 1959 (M. Alvarenga), in AMNH. The specific name is an arbitrary combination of letters derived from the stated name of the locality.

Description. Male holotype. Carapace, chelicerae, sternum orange-brown. Sternum with some black pigment spots. Legs orange. Dorsum of abdomen brownish, posteriorly grading into black; venter dusky. Second femur with a ventral short macroseta. Second tibia thicker than first. Total length 2.5 mm. Carapace 1.32 mm long, 1.09 wide in thoracic region, 0.97 wide in cephalic region. First femur 0.85 mm, patella and tibia 1.17, metatarsus 0.88, tarsus 0.42. Second patella and tibia 1.05 mm, third 0.66, fourth 0.87. Fourth femur 0.91 mm. Abdomen 2.3 mm long, 2.2 mm wide.

Diagnosis. *Hypognatha jacaze* differs from the other *Hypognatha* species with a large soft median apophysis by having only two large lobes (at 4 hr in Fig. 235; Fig. 236) and by lacking the embolus-shaped coil of the terminal apophysis present in *H. fureifera* (Fig. 228) and *H. deplanata* (Fig. 206).

Specimens Examined. No other specimens were found.

Encyosaccus Simon

Encyosaccus Simon, 1895b: 847. Type species *E. sexmaculatus*, designated by Simon. Neave, 1939b: 229. The gender of the name is masculine (Bonnet, 1956: 1656).

Diagnosis. Female carapace as wide in eye region as in thoracic, as in *Gasteracantha*. Unlike *Gasteracantha*, carapace of male also as wide in eye region as thoracic. Sternum pointed posteriorly, between fourth coxae (Fig. 240), unlike *Gasteracantha*. Abdomen oval, wider than long, with sclerotized disks, but lacking spines. Ring around spinnerets not sclerotized. Fourth legs of female longer than first.

Genitalia. Epigynum simple, with median, pointed lobe (Fig. 241), and posterior view with sclerotized lateral plates separated by a median plate (Fig. 242).

Male palpus wider than long (as in *Xylethrus*). Palpus lacks terminal apophysis (as in *Gasteracantha* and *Xylethrus*), embolus bent, supported by conductor (at 1 hr in Fig. 247). With curved sickle-shaped paramedian apophysis (at 12 hr in Fig. 247) and small median apophysis with square projection (below the center in Fig. 247).

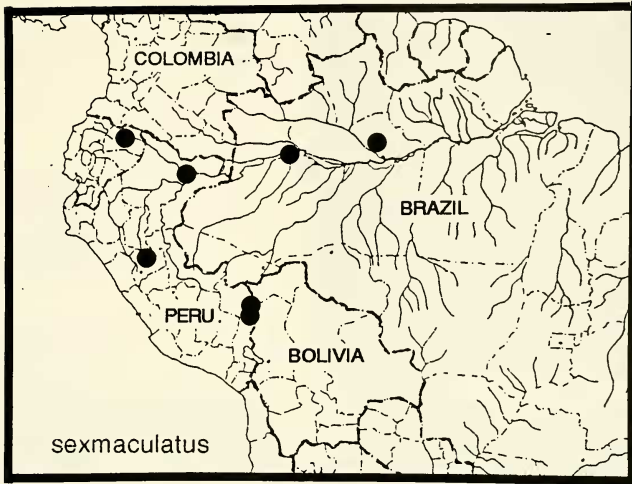
The palpus resembles that of *Spilasma*, the conductor and paramedian apophysis being similar in shape (Levi, 1995b, fig. 151). Also, the palpus is similar to that of *Micrathena nigrichelis* Strand (Levi, 1985, fig. 6).

Relationship. The elongated fourth femur is a synapomorphy of *Hypognatha*, *Xylethrus*, *Gasteracantha*, *Micrathena*, and *Pronous*. The square carapace and absence of terminal apophysis in the palpus are synapomorphies with *Gasteracantha*. The oval, wider than long, sclerotized abdomen is an autapomorphy of *Encyosaccus*.

Distribution. Only one species is known, from South America (Map 3).

Encyosaccus sexmaculatus Simon Plate 1; Figures 237–247; Map 3

Encyosaccus sexmaculatus Simon, 1895b: 847, fig. S94, ♀. Female holotype from Fonte Boa, Ama-



Map 3. Distribution of *Encyosaccus sexmaculatus*.

zonas State, Brazil, in MNHN, examined. Roewer, 1942: 935. Bonnet, 1956: 1656.

Description. Female from Napo Prov., Ecuador. Carapace, chelicerae, endites, sternum bright orange-red. Legs bright orange, metatarsi and tarsi black, except proximal ends of metatarsi. Abdomen white with paired black sclerotized patches within three pairs of orange areas (Pl. 1, Fig. 244); venter bright orange; edge around abdomen with sharply defined black line. Posterior median eyes 0.8 diameter of anterior medians, anterior laterals 0.6, posterior laterals 0.5 diameter. Anterior median eyes 0.7 diameter apart. Posterior median eyes their diameter apart. Ocular quadrangle slightly wider in front than behind. Height of clypeus equals 1.3 diameters of anterior median eye. Fourth legs almost equal to first leg in length. Abdomen a dorsal-ventrally flattened disk (Fig. 244), slightly wider than long, ring around spinnerets weakly sclerotized. Total length 9.4 mm. Carapace 4.4 mm long, 3.7 wide in thoracic region, 3.8 wide in cephalic region. First femur 2.7

mm, patella and tibia 3.4, metatarsus 2.1, tarsus 1.1. Second patella and tibia 3.3 mm, third 2.3. Fourth femur 2.9, patella and tibia 3.4, metatarsus 2.1, tarsus 1.1. Abdomen 7.2 mm long, 7.4 wide. Abdomen 1.03 times wider than long.

Male from Zona Reservada Tambopata, Peru. Cephalothorax orange, median eye region black, distal leg articles dusky to brown. Dorsum of abdomen orange with edge of abdomen black (Fig. 246); venter orange. Posterior median eyes 0.7 diameter of anterior medians, laterals 0.6 diameter. Anterior median eyes their diameter apart. Posterior median eyes 0.7 diameter apart. Ocular quadrangle almost square, slightly narrower behind than in front. Height of clypeus equals 0.9 diameter of anterior median eye. Endite without tooth. Palpal patella with one macroseta. First coxa without hook. Second tibia slightly S-curved. Total length 3.4 mm. Carapace 1.6 mm long, 1.4 wide, 1.2 wide behind lateral eyes. First femur 1.1 mm, patella and tibia 1.4, metatarsus 0.7, tarsus 0.5. Second patella and tibia 1.2 mm, third 0.8,

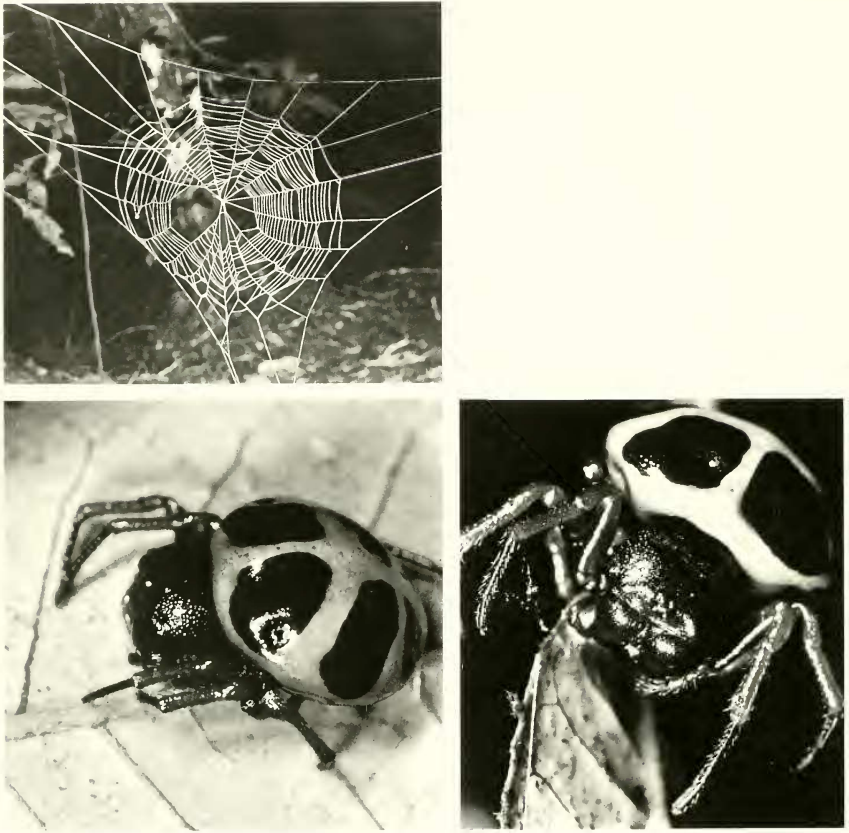


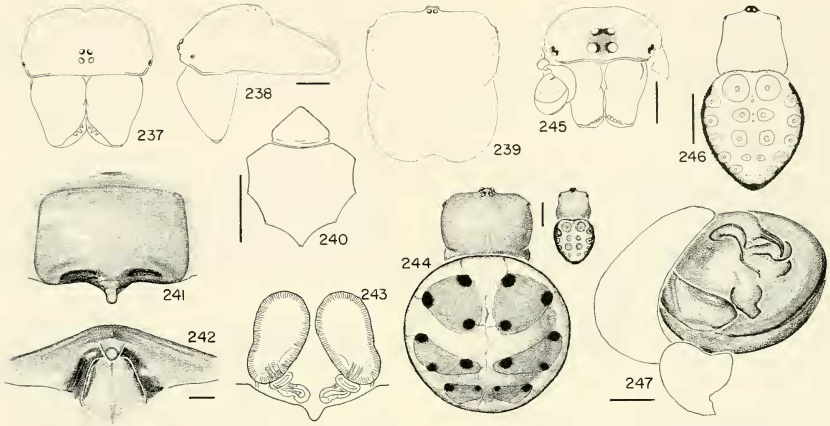
Plate 1. Upper left, web of *Hypognatha scutata* from Trinidad, 14 cm horizontal diameter of web (photo J. Coddington). Lower, female *Encyosaccus sexmaculatus* from near Iquitos, Peru (photo J. Warfel).

fourth 1.0. Abdomen 2.4 mm long, 2.2 wide.

Note. Females and males have been matched on basis of being collected together.

Variation. Total length of females 8.5 to 9.4 mm. The coloration of females is variable. The holotype has the cephalic area of the carapace black (as in Pl. 1) and the abdomen with orange patches, but without

black. A specimen from near Manaus resembles the type but lacks the paired orange patches, having black disks on white. Another had black covering the median eyes and a black patch covering each of the round sclerotized disks on white. The specimen photographed (Pl. 1) has the prosoma crimson red with black, the dorsum of the abdomen with black patches on an orange field. The illustrations were



Figures 237–247. *Encycosaccus sexmaculatus* Simon. 237–244, female. 237, eye region and chelicerae. 238, carapace and chelicera, lateral. 239, carapace. 240, sternum. 241–243, epigynum. 241, ventral. 242, posterior. 243, cleared. 244, dorsal with male. 245–247, male. 245, eye region, chelicerae and right palpus. 246, dorsal. 247, left palpus.

Scale lines. 1.0 mm; Figure 245, 0.5 mm; genitalia 0.1 mm.

made of a female from Ecuador and a male from Depto. Madre de Dios, Peru.

Diagnosis. The shape and bright color readily separate this species from other American orb weavers. The epigynum has a simple, pointed, median lobe (Fig. 241). The palpus has the sclerotized embolus curved (Fig. 247).

Specimens Examined. ECUADOR *Napo*: Añangu, 3 June 1982, 1♀ (L. Avilés 82–2, MECN). PERU *Loreto*: 60 km N Iquitos, 1994, photo only of ♀ (Pl. I, J. Warfel). *Huánuco*: Cucharas, Huallaga Valley, Feb.–Apr. 1954, 1♀ (F. Woytkowski, CAS). *Madre de Dios*: Alberque Cuzco Amazonico, 12°50'S, 69°05'W, 21 Feb. 1990, 1♀, 4–6 Mar. 1990, 2♀, 1♂ (D. Silva D., MUSM), 24 May 1990, 1♀ (P. Lozada, USNM); Zona Reservada Tambopata, 12°50'S, 69°17'W, 8 June 1988, 1♂ (J. Coddington, USNM). BRAZIL *Amazonas*: Km 41 Reserve, 80 km N Manaus, 1989–92, 1♀ (H. G. Fowler, MCZ); 23 May 1991, 1 imm. (H. G. Fowler, R. S. Vieira, E. Venticinque, MCZ).

Xylethrus Simon

Xylethrus Simon, 1895b: 865. Type species *X. superbus* designated by Simon. Neave, 1940: 679. The gender of the name is masculine (Bonnet, 1959: 4844).

Diagnosis. Abdomen as wide as long, or

wider than long, that of male narrower. Abdomen covered with sclerotized disks, including round hemispherical tubercles (or conical ones in *X. ameda*), also with anterior, median, flat disk (Figs. 256, 268, 274). Sclerotized ring around spinnerets. Unlike other orb weavers, including *Gasteracantha*, *Xylethrus* has the sternum as wide as long to wider than long, truncate posteriorly between fourth coxae, and with several tubercles along edge (Figs. 251, 263, 279, 282). Male palpi wider than long (Figs. 275, 287) and, unlike that of other orb weavers, with paramedian apophysis drawn out into a thread (Figs. 276, 281, 291).

The wide palpus can be confused with that of male *Cyclosa*, but males of *Cyclosa* lack sclerotized disks on the abdomen and have the carapace with a narrow cephalic region.

Description. Female. Coloration variable, orange to brown, abdomen gray to black on underside. Lateral swellings, just behind eyes, more than two-thirds width of thoracic region of carapace (Figs. 250,

256, 261, 268). Cephalic region very high (Figs. 248, 249). Posterior median eyes usually slightly smaller than anterior medians, laterals smaller than either. Median ocular quadrangle square to wider than long. Clypeus height equals 1 to 2 diameters of anterior median eye. Fourth legs equal to, or slightly longer than, first. First and second of almost equal length.

Males. Males dwarfed, much smaller than females (Figs. 258, 270), abdomen narrower, but similar in shape (Figs. 258, 270, 274, 277, 283, 286, 290) and with similar sternum (Figs. 279, 282). Dwarf males lack endite tooth, coxal hook, modified legs. Palpal patella with one weak seta.

Genitalia. Epigynum with a simple median lobe (Figs. 252, 259, 264) and a posterior pair of depressions close to ventral margin (Figs. 253, 260, 265).

Palpus oval (Figs. 275, 280), wider than long, terminal apophysis lost (as in *Gasteracantha*), and conductor small with a transparent lobe covering sclerotized part of conductor (C in Figs. 276, 281). Embolus long (E in Figs. 276, 281) and with long paramedian apophysis pointing in opposite direction from that of embolus (PM in Figs. 276, 281). Median apophysis (M in Figs. 276, 281) small, indistinct, and lightly sclerotized.

Variation. Females, who have oviposited, with abdomen shrunken in a median longitudinal line, making abdomen U-shaped in posterior view, and with narrower transverse diameter than when fully expanded.

Relationship. The relatively wide abdomen, the sclerotized disks and sclerotized ring around the spinnerets, (Figs. 257, 262, 269) and the loss of the terminal apophysis (Fig. 276) are assumed synapomorphies with *Gasteracantha*. The fourth legs longer than first is a synapomorphy with *Micrathena*.

The hemispherical, sclerotized tubercles (Figs. 256, 261, 269), conical in *X. ameda* (Fig. 286), and the truncate posterior end of the sternum (Figs. 251, 279) are autapomorphies of *Xylethrus*. Also, the elon-

gated, thread-shaped paramedian apophysis (PM in Fig. 276) is an autapomorphy.

Distribution. All *Xylethrus* species are Neotropical (Map 4).

Natural History. The female has been found at night in the middle of an orbweb. The hub of the web is eccentric; the web below the hub becomes narrower and longer. It appears to be very sticky. During the day females may be found on leaves, looking like bird droppings. Juveniles may hang from silk lines in dry vegetation (D. Silva D., personal communication).

Separating Species. Females are easiest to separate by the shape of the abdomen and the shape of the tubercles (Figs. 256, 261, 268). The epigynum appears variable within species (Figs. 253, 255, 265, 267). We know the males of five species but only four species of females. Only one *X. superbis* has been collected with a male, and the association of the male with the female of others is uncertain.

KEY TO FEMALE XYLETHRUS

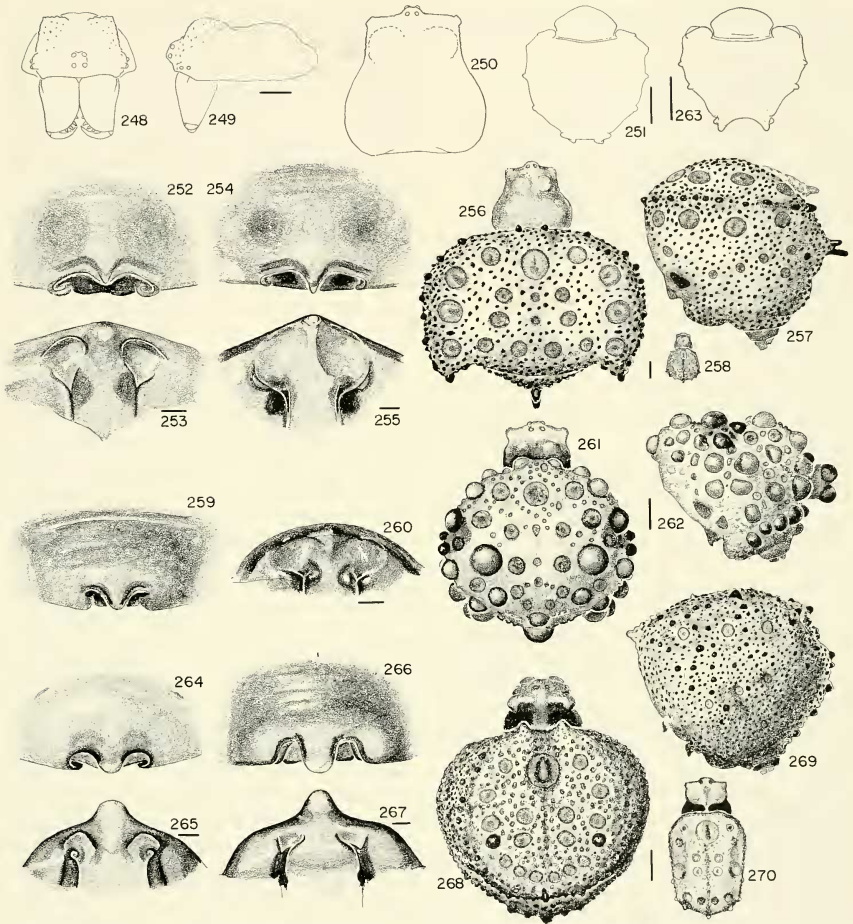
Females of *X. ameda* and *X. anomid* are not known.

1. Abdomen wider than long, with median, posterior extension and posterior lateral extensions on each side (Fig. 256, 289) 2
- Abdomen width about equal to its length, without posterior, lateral extensions (Figs. 261, 268) 3
- 2(1). Female from South America (Map 4A) *superbis*
- Female from Mexico or Greater Antilles (Map 4D) *arawak*
- 3(1). Large hemispherical tubercles around border of dorsum of abdomen (Fig. 261) and on sides of abdomen (Fig. 262) *perlatus*
- Only tiny tubercles around border of dorsum of abdomen (Figs. 268, 269) and on sides (Fig. 269) *scrupeus*

KEY TO MALE XYLETHRUS

The association of males with females is uncertain. The male of *X. perlatus* is not known.

1. Abdomen with conical tubercles (Fig. 286) *ameda*
- Abdomen with flat or hemispherical tubercles (Figs. 274, 277, 283) 2
- 2(1). Tip of embolus of palpus curled (at 2 to 3 hr in Fig. 284) *anomid*



Figures 248–258. *Xylethrus superbis* Simon. 248–257, female. 248, eye region and chelicerae. 249, carapace and chelicera, lateral. 250, carapace. 251, sternum. 252–255, epigynum. 252, 254, ventral. 253, 255, posterior. 252, 253, (lectotype). 254, 255, (from Depto. Madre de Dios, Peru). 256, dorsal. 257, abdomen lateral. 258, male, same magnification as female.

Figures 259–262. *X. perlatus* Simon, female. 259, 260, epigynum. 259, ventral. 260, posterior. 261, dorsal. 262, abdomen, lateral.

Figures 263–270. *X. scrupeus* Simon. 263–259, female. 263, sternum. 264–267, epigynum. 264, 266, ventral. 265, 267, posterior. 264, 265, (lectotype). 266, 267, (from Depto. Madre de Dios, Peru). 268, dorsal. 269, abdomen, lateral. 270, male, dorsal, same magnification as female.

Scale lines. 1.0 mm; Figures 248–251, 263, 0.5 mm; genitalia 0.1 mm.

-	Embolus straight (Figs. 275, 280, 287, 291)	3
3(2).	Abdomen as wide as long or wider than long (Figs. 274, 290)	4
-	Abdomen longer than wide (Fig. 277); embolus an undulating thread (Fig. 280)	
	<i>scrupus</i>	
4(3).	Paramedian apophysis thread-shaped (Fig. 275); South America (Map 4A)	<i>superbus</i>
-	Paramedian apophysis sickle-shaped (Fig. 291); Mexico, Greater Antilles (Map 4D)	<i>arawak</i>

***Xylethrus superbus* Simon**

Figures 248–258, 271–276;
Map 4A

Xylethrus superbus Simon, 1895b: 865; 1895b: 158, figs. 926 ♀, 927 ♂. Female lectotype, male and immature paralectotypes from São Paulo, Brazil [São Paulo de Olivença, Amazonas State], in MNHN no. 8195, examined. Roewer, 1942: 951. Bonnet, 1959: 4844.

Xylethrus trifidus Simon, 1895a: 157. Immature holotype from Paraguay in MNHN, examined. Roewer, 1942: 951. Bonnet, 1959: 4844. NEW SYNONYMY.

Xylethrus peruanus Archer, 1971: 157, figs. 1, 2, ♀. Female holotype from Moyabamba, Depto. San Martín, Peru, in AMNH, examined. Brignoli, 1983: 249. NEW SYNONYMY.

Note. The male paralectotype collected with the female *X. superbus*, and illustrated by Simon, is a male of an *Enacrosoma* species. The holotype of *X. trifidus* is an early instar, probably female, about 3 mm total length. The dorsal outline of the individual is as in an adult *X. superbus*. Archer's specimen of *X. peruanus* is a female *X. superbus*.

Description. Female from Depto. Madre de Dios, Peru. Cephalothorax reddish orange. Abdomen orange with circular sclerites, orange spinnerets and ring around spinnerets and many brown to black hemispherical spots. Carapace with two humps in cephalic region, and surface of cephalic region with grainy sculpturing (Figs. 248–250). Posterior median eyes 0.9 diameter of anterior medians, laterals 0.8 diameter. Anterior median eyes 1 diameter apart. Posterior median eyes 1.1 diameters apart. Ocular quadrangle square. Height of clypeus equals 1.5 diameters of the anterior median eye. Abdomen wider than

long with posterior median and lateral extensions (Figs. 256, 257). Sclerotized ring around spinnerets (Fig. 257) broken anteriorly, and sometimes broken into several sclerites, as in a necklace. First two tibiae slightly S-shaped, metatarsi slightly curved. Total length 15.0 mm. Carapace 4.8 mm long, 4.5 wide in thoracic region, 3.0 wide in cephalic region. First femur 3.4 mm, patella and tibia 4.2, metatarsus 2.2, tarsus 1.1. Second patella and tibia 4.2 mm, third 3.7. Fourth femur 4.0 mm, patella and tibia 4.7, metatarsus 2.4, tarsus 1.1.

Male from Depto. Madre de Dios, Peru. Carapace orange-brown, eyes without black pigment. Chelicerae, labium, endites orange. Sternum light orange. Legs orange with indistinct darker rings. Abdomen orange, some white pigment between large sclerites and an indistinct longitudinal black band on each side and through middle; venter orange. Posterior median eyes same diameter as anterior medians, anterior laterals 0.6 diameter, posterior laterals 0.7. Anterior median eyes their diameter apart. Posterior median eyes 1.1 diameters apart. Median ocular quadrangle almost square, slightly wider behind than in front. Height of clypeus equal to 1 diameter of anterior median eye. Abdomen as wide as long (Figs. 258, 274). Total length 3.0 mm. Carapace 1.38 mm long, 1.14 wide in thoracic region, 1.04 wide in cephalic region. First femur 0.81 mm, patella and tibia 1.04, metatarsus 0.46, tarsus 0.40. Second patella and tibia 1.01 mm, third 0.84. Fourth femur 1.00 mm, patella and tibia 1.04, metatarsus 0.49, tarsus 0.40.

Note. The only male was collected with a female. As in the female, the abdomen of the male is wider than that of other male *Xylethrus* species, except for *X. arawak*.

Variation. Total length of females 7.6 to 13.0 mm. The epigynum is quite variable in posterior view (Figs. 253, 255). Illustrations were made from specimens from Madre de Dios, Peru, and Figures 252 and 253 from the lectotype.

Map 4. Distribution of *Xylethrus* species.

Diagnosis. The abdomen is wider than that of other species, except *X. arawak*, and has a posterior pair of lateral extensions and a median extension (Fig. 282). The Amazonian and Brazilian distribution separates *X. superbis* from the Caribbean and Mexican *X. arawak*. The male differs from others by having the abdomen about as wide as long (Figs. 258, 274) and, unlike *X. arawak* (Fig. 291), has a thread-shaped

paramedian apophysis (PM in Fig. 276) whereas that of *X. arawak* is sickle-shaped (Fig. 291). Also, the male lacks a slight constriction of the median apophysis (M in Fig. 276) present in *X. arawak*.

Natural History. The male was collected at night with the female, the male under a leaf. Another male (not in the available collections) was under another leaf nearby, 130 cm above ground (information

from specimen labels). One immature specimen was collected in cerrado scrub in Mato Grosso.

Specimens Examined. BRAZIL *Pará:* Fazenda Velha, Belém, Aug. 1970, 1 imm. (M. E. Galiano, MACN). *Goiás:* Araguari [?], Mar. 1930, 2♀ (R. Spitz, MZSP 7718). *Mato Grosso:* 260 km N Xavantina, 12°49'S, 51°46'W, 400 m, Apr. 1969, 1 imm. (Xavantina-Cachimbo Exped., MCZ); Barra do Tapirape, 11–30 Nov. 1960, 1♀ (B. Malkin, AMNH). *São Paulo:* Barueri, 10 July 1966, 1 imm. (K. Lenko, MUSP 9603). *Santa Catarina:* Res. Biol. Mar. Arvoredo, 13, 14 Oct. 1994, 1 imm. (A. Braul, MCP 5093). PERU *Madre de Dios:* 15 km E Puerto Maldonado, 200 m, 12°33'S, 69°03'W, 1♀; Zona Reservada Pakitzta, 356 m, 11°56'S, 71°17'W, 1–9 Oct. 1991, 1♀, 1♂, 17 Oct. 1991, 1♀ (all D. Silva D., MUSM); Zona Reservada de Manu, Río Troche, 11°58'S, 71°18'W, 5 Oct. 1987, 1 imm. (J. Coddington, USNM). BOLIVIA *El Beni:* Estación Biológico Beni, 14°47'S, 66°15'W, 8–14 Sept. 1989, 2♀ (J. Coddington et al., USNM). PARAGUAY *La Cordillera:* San Bernardino, 1♀ (E. Reimoser, MCZ).

Xylethrus perlatus Simon

Figures 259–262

Xylethrus perlatus Simon, 1895a: 158. Female holotype from Mato Grosso, Brazil, in MNHN no. 10555, examined. Roewer, 1942: 951. Bonnet, 1959: 4844.

Note. Unfortunately the type locality is not specific. Mato Grosso is a vast area of Brazil and, at the time of the descriptions, included other states to the northwest and south of the present Mato Grosso State.

Description. Female holotype. Carapace brown, eye region orange. Chelicerae orange to brown. Labium, endites orange. Sternum orange with darker edge. Coxae orange; legs orange, ringed brown. Abdomen orange to brown with a black patch on each side. Posterior median eyes subequal to anterior medians, anterior laterals 0.6 diameter, posterior laterals 0.8. Anterior median eyes 1.5 diameters apart. Posterior median eyes 1.3 diameters apart. Ocular quadrangle rectangular, slightly

wider than long. Height of clypeus equals 2 diameters of anterior median eye. Abdomen with flat disks and numerous paired, hemispherical protuberances (Figs. 261, 262). Ring around spinnerets broken anteriorly. Total length 7.3 mm. Carapace 2.7 mm long, 2.9 wide in thoracic region, 2.5 at lateral eyes. First femur 2.3 mm, patella and tibia 2.7, metatarsus 1.6, tarsus 0.8. Second patella and tibia 2.7 mm, third 2.2. Fourth femur 2.4 mm, patella and tibia 2.9, metatarsus 1.4, tarsus 0.9. Abdomen 5.6 mm long, 5.6 wide.

Variation. The animal was apparently collected after producing eggs and is caved in, making the abdomen U-shaped in dorsal view, the sides up, the center down. A similar collapse of the dorsal shape was also seen in some *X. scrupeus* and *X. superbus* specimens.

Note. *Xylethrus anomid* might be the male of this species.

Diagnosis. The many large hemispherical tubercles on the abdomen (Figs. 261, 262) separate this from *X. scrupeus*.

Specimens Examined. No other specimens were collected.

Xylethrus scrupeus Simon

Figures 263–270, 277–281; Map 4B

Xylethrus scrupeus Simon, 1895a: 159. Female lectotype, three immature and one male paralectotypes from Amazon State, Pará, Bahia and Mato Grosso; female lectotype here designated from the Amazon, in MNHN no. 7994, examined. Roewer, 1942: 951.

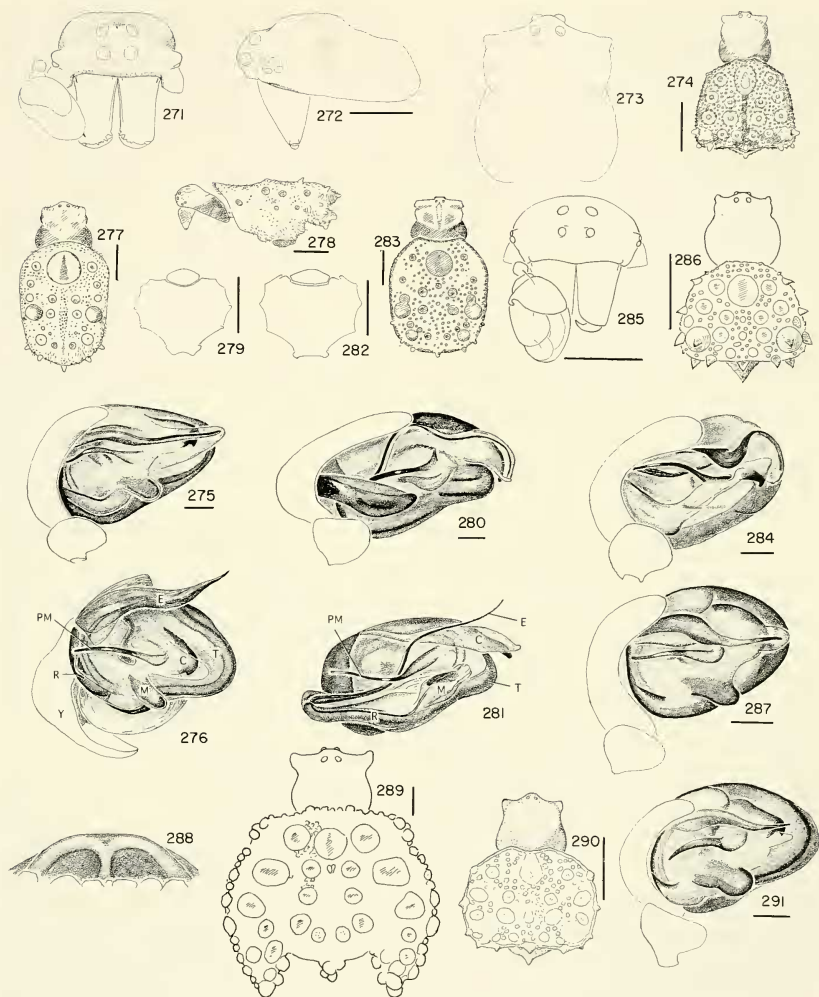
Xylethrus scrupeus [sic]:—Bonnet, 1959: 4844.

Note. The male paralectotype is described below as a new species *Xylethrus anomid*.

Description. Female from Depto. Madre de Dios, Peru. Carapace, cephalic region brown, thoracic region black, separated by an orange transverse line (Fig.

Figures 271–276. *Xylethrus superbus* Simon, male. 271, eye region, chelicerae and right palpus. 272, carapace and chelicera. 273, carapace. 274, dorsal. 275, left palpus. 276, palpus, pulled apart.

Figures 277–281. *X. scrupeus* Simon, male. 277, dorsal. 278, lateral. 279, sternum and labium. 280, palpus. 281, palpus bulb, pulled apart.



Figures 282–284. *X. anomid* n. sp., male. 282, sternum and labium. 283, dorsal. 284, palpus.

Figures 285–287. *X. ameda* n. sp., male. 285, eye region, chelicerae and right palpus. 286, dorsal. 287, palpus.

Figures 288–291. *X. arawak* n. sp. 288, 289, female (after Archer). 288, epigynum, posterior. 289, dorsal. 290, 291, male. 290, dorsal. 291, palpus.

Abbreviations. C, conductor. E, embolus. M, median apophysis. PM, paramedian apophysis. R, radix. T, tegulum. Y, cymbium.

Scale lines. 1.0 mm; genitalia 0.1 mm; Figures 271–273, 279, 282, 285, 0.5 mm.

268). Chelicerae, labium, endites dark brown, sternum orange with black rim and three indistinct black patches. Coxae, legs dark brown, ringed orange. Abdomen dark reddish brown. Posterior median eyes 0.8 diameter of anterior medians, laterals 0.5 diameter. Anterior median eyes 1 diameter apart. Posterior median eyes 2.5 diameters apart. Ocular trapezoid wider than long, wider behind than in front. Height of clypeus equals 0.5 diameter of the anterior median eye. Abdomen with complete, sclerotized ring around spinnerets (Fig. 269). Total length 9.0 mm. Carapace 3.4 mm long, 3.3 wide in thoracic region, 2.7 wide in cephalic region. First femur 2.5 mm, patella and tibia 2.8, metatarsus 1.6, tarsus 0.8. Second patella and tibia 2.8 mm, third 2.7. Fourth femur 3.1 mm, patella and tibia 3.2, metatarsus 1.7, tarsus 0.9.

Male from Chacobo Indian Village, Bolivia. Carapace orange, posterior black with white setae and a pair of brown patches in cephalic region. Chelicerae, sternum orange. Legs brown with indistinct orange rings. Abdomen speckled brown and orange. Posterior median eyes same diameter as anterior medians, laterals 0.6 diameter. Anterior median eyes 1.5 diameters apart. Posterior median eyes 2 diameters apart. Ocular trapezoid wider than long and wider behind than in front. Height of clypeus equal to 1.5 diameters of anterior median eye. Total length 4.8 mm. Carapace 1.8 mm long, 1.6 wide in thoracic region, 1.2 wide in cephalic region. First femur 1.1 mm, patella and tibia 1.3, metatarsus 0.7, tarsus 0.5. Second patella and tibia 1.3 mm, third 1.2. Fourth femur 1.3 mm, patella and tibia 1.4, metatarsus 0.7, tarsus 0.5.

Note. The match of males to females is uncertain. Males and females were matched because adult males were found on Barro Colorado Island, Panama, with immatures, which were believed to be *X. scrupeus*. Also, there are no records of species other than *X. scrupeus* from north-western South America.

Variation. Total length of females 7.7 to 9.6 mm, males 4.5 to 4.8. The illustrations were made from a female from Madre de Dios, Peru, and Figures 264 and 265 from the lectotype. The male from Bolivia was illustrated (Figs. 277–280), and the expanded palpus (Figs. 281) from a male from Panama.

Diagnosis. Unlike *X. superbis*, the female of *X. scrupeus* has a subspherical abdomen (Figs. 268, 269) and, unlike *X. perlati* (Figs. 261, 262), lacks large hemispherical tubercles on the abdomen (Figs. 268, 269). The palpus differs by having the embolar thread undulating (Fig. 280).

Specimens Examined. PANAMA *Panamá:* Barro Colorado Island, Jan. 1936, 1♂ (J. A. Grisvold, MCZ); July 1936, 2 imm., 15 Jan. 1958, 1♂ (both A. M. Chickering, MCZ). COLOMBIA *Meta:* Finca Chenevo, 20 km N Río Muco, 20 km S El Porvenir, 170 m, 1978, 1♀ (W. Eberhard, MCZ). PERU *Ucayali:* Pucallpa, 2 Oct. 1954, 1♀ (E. I. Schlinger, E. S. Ross, CAS). *Madre de Dios:* 15 km E Puerto Maldonado, 12°33'S, 69°03'W, 24 June 1989, 1♀ (D. Silva D., MUSM); Zonas Reservada Tambopata, 12°50'S, 69°17'W, 13 June 1988, 2 imm., 1♀ (MCZ ex MUSM); 20 Sept. 1991, 1♀ (D. Silva D., MUSM); 12 June 1988, 1 imm. (J. Coddington, USNM). BRAZIL *Amazonas:* Reserva Ducke, Manaus, 2 Aug. 1991, 1♀ (H. Kückmeister, LNK). BOLIVIA *El Beni:* Estación Biológico Beni, 14°47'S, 66°15'W, 8–14 Nov. 1989, 2♀ (J. Coddington et al., USNM); Chacobo Indian Village, Río Benicito, 12°30'S, 66°00'W, 31 Aug. 1960, 1♂ (B. Malkin, AMNH).

Xylethrus anomid new species Figures 282–284; Map 4C

Holotype. Male holotype from Dimona Reserve, ca. 80 km N Manaus, Amazonas, Brazil, 1989–92 (H. G. Fowler) in MCN. The specific name is derived from the locality spelled backward.

Male holotype. Carapace orange with thoracic region dark brown, an anterior median longitudinal band and two dark patches posteriorly in cephalic region. Sternum orange with brown rim, legs ringed brown and orange. Abdomen light beige with brown spots. Posterior median eyes 1.2 diameters of anterior medians, laterals 0.8 diameter. Anterior median eyes 1.2 diameters apart. Posterior median eyes 1.8 diameters apart. Laterals separated by their radius. Ocular trapezoid wider than

long, wider behind than in front. Height of clypeus equal to 1.5 diameters of anterior median eye. Total length 4.8 mm. Carapace 1.9 mm long, 1.7 wide in thoracic region, 1.4 wide in cephalic region. First femur 1.2 mm, patella and tibia 1.4, metatarsus 0.8, tarsus 0.5. Second patella and tibia 1.5 mm, third 1.3. Fourth femur 1.4 mm, patella and tibia 1.5, metatarsus 0.8, tarsus 0.5.

Diagnosis. The distal curl of the embolus (at 2 to 3 hr in Fig. 284) separates *X. anomid* from all other *Xylethrus* species.

Note. The male paralectotype of *X. scrupeus*, of uncertain locality, belonged to this species. This may be the male of *X. perlatus*.

Specimens Examined. PERU *Loreto:* Alto Río Samiria, 05°07'S, 75°28'W, 15 May 1990, 1♂ (D. Silva D., MUSM).

***Xylethrus ameda* new species**
Figures 285–287; Map 4C

Holotype. Male holotype from Diadema, São Paulo State, Brazil, 11 Feb. 1961 (P. de Biasi) in MZSP no. 8373. The specific name is an arbitrary combination of letters derived from the locality spelled backward.

Description. Male holotype. Carapace brown, thoracic region lightest. Chelicerae orange-brown. Labium, endites orange, proximally brown. Sternum orange with brown rim; brown extending at coxal insertions, brown patch behind labium. Coxae orange; legs orange and brown, indistinctly ringed. Dorsum of abdomen brown, a pair of white patches anteriorly under the integument; venter black. Posterior median eyes 1.3 diameters of anterior medians, anterior laterals 0.8 diameter, posterior laterals 1 diameter. Anterior median eyes 1.2 diameters apart. Posterior median eyes 0.8 their diameter apart. Ocular quadrangle about square, slightly wider behind than in front. Height of clypeus equals 1.8 diameters of anterior median eye. Cephalic region low. Abdomen widest posteriorly (Fig. 286). Total length 2.4 mm. Carapace 1.17 mm long, 1.06 wide,

0.80 wide behind lateral eyes. First femur 0.87 mm, patella and tibia 1.04, metatarsus 0.53, tarsus 0.42. Second patella and tibia 1.03 mm, third 0.82. Fourth femur 0.93 mm, patella and tibia 0.96, metatarsus 0.50, tarsus 0.42.

Diagnosis. This species differs from other *Xylethrus* by having conical rather than hemispherical tubercles (Fig. 286).

Specimens Examined. No other specimens were found.

***Xylethrus arawak* Archer**
Figures 288–291; Map 4D

Xylethrus arawak Archer, 1966: 130, figs. 6, 7, ♀.
 Female holotype from Manchester Grove Place [Grove Place, Manchester Parish], Jamaica, West Indies, in SMIJ, lost [also not in AMNH]. Brignoli, 1983: 249.

Description. Female (from Archer). Total length 7.9 mm. Carapace 3.1 mm long, 2.3 wide, Abdomen 6.0 mm long, 6.3 mm wide.

Male. Carapace orange to brown. Clypeus, chelicerae orange. Labium, endites. Sternum orange with brown. Legs orange with brown rings. Abdomen orange and brown (Fig. 290). Posterior median eyes 1.1 diameters of anterior medians, anterior laterals 0.6 diameter, posterior laterals 0.8. Anterior median eyes their diameter apart. Posterior median eyes 1.1 diameters apart, their diameter from laterals. Ocular quadrangle slightly wider behind than in front. Height of clypeus equals 1.4 diameters of anterior median eye. Endite without tooth. Palpal patella with no macroseta. First coxa without hook. Second tibia thicker than first. Abdomen wider than long (Fig. 290). Total length 2.7 mm. Carapace 1.27 mm long, 1.12 wide, 1.01 wide in cephalic region. First femur 0.88 mm, patella and tibia 1.04, metatarsus 0.53, tarsus 0.39. Second patella and tibia 0.98 mm, third 0.82. Fourth femur 1.01, patella and tibia 1.04.

Note. The male is considered to be Archer's *X. arawak*, because of the collecting locality and its shape of the abdomen and wide lobe bearing lateral eyes (Fig. 290).

Diagnosis. The female differs from *X. superior*, which also has a wide abdomen, by occurring in the West Indies and Yucatan Peninsula. The male differs from others by the relatively wide abdomen and sickle-shaped paramedian apophysis (on center of Fig. 291).

Specimens Examined. MEXICO Quintana Roo: Reserva de Sian Ka'an, S of Felipe Carrillo Puerto, 6 July 1993, 1♂ (G. Alayón, MCZ).

Gasteracantha Sundevall

Gasteracantha Sundevall, 1833: 14. The type species is *Gasteracantha cancriformis*. The gender of the name is feminine (Bonnet, 1957: 1934).

Bimocrania Thorell, 1878: 25. The type species is *B. biloba* from Burma. NEW SYNONYMY.

Vibradellus Chamberlin, 1925: 214. The type species by original designation and monotypy is *V. carolinus* (= *Gasteracantha cancriformis*).

Note. The immature male holotype of *Bimocrania biloba* is in the MCSNG (examined). It matches a mature male collected later (Thorell, 1898: 374), also in the MCSNG, examined. A male determined by Thorell is also in the NRMS (Scharff, personal communication).

More information on the *Gasteracantha* type species designation is found in Levi (1978), and additional information on the numerous *Gasteracantha* synonyms is in Roewer (1942: 935) and Bonnet (1957: 1934).

Diagnosis. The female carapace is square (Fig. 294), high anteriorly (Fig. 293), and rebordered as in *Micrathena* (Levi, 1985, figs. 18, 19). Unlike species of similar genera, females have a sclerotized hump between epigynum and spinnerets (Levi, 1978, figs. 71, 73). The male carapace is narrow anteriorly (Fig. 308), unlike

that of *Encyosaccus*, and the palpus has a circular paramedian apophysis (PM in Fig. 312). In both male and female, the abdomen is wider than long (Figs. 298, 309, 311); in the male, it tends to be widest posteriorly with two posterior, lateral corners (Fig. 311) or posterior-facing, lateral lobes.

Distribution. There are numerous tropical species worldwide but in the Americas only one variable species. A second species may owe its record to an error in curating. Perhaps the competition of the numerous *Micrathena* species, absent from other continents, prevents *Gasteracantha* from speciating.

Relationship. *Gasteracantha* shares the elongate fourth femur (fourth longer than first) with *Micrathena*, *Pronous*, *Hypognatha*, *Encyosaccus*, and *Xylethrus* (Table 1).

Gasteracantha cancriformis (Linné)

Figures 292–312

Aranea cancriformis Linné, 1767: 1037. Specimens described from America, probably lost.

Aranea tetracantha Linné, 1767: 1037. Specimens from St. Thomas [Virgin Islands], probably lost. Pallas, 1772: 49, pl. 3, figs. 16, 17, ♀. NEW SYNONYMY.

Aranea hexacantha Fabricius, 1787: 344. Named and described without locality.

Epeira lata Walckenaer, 1805: 66. No locality cited, but in 1841: 165, cited as coming from Guadeloupe [Lesser Antilles], specimens lost. NEW SYNONYMY.

Epeira servillei Guérin-Ménéville, 1825: 263. Specimens from Brazil. NEW SYNONYMY.

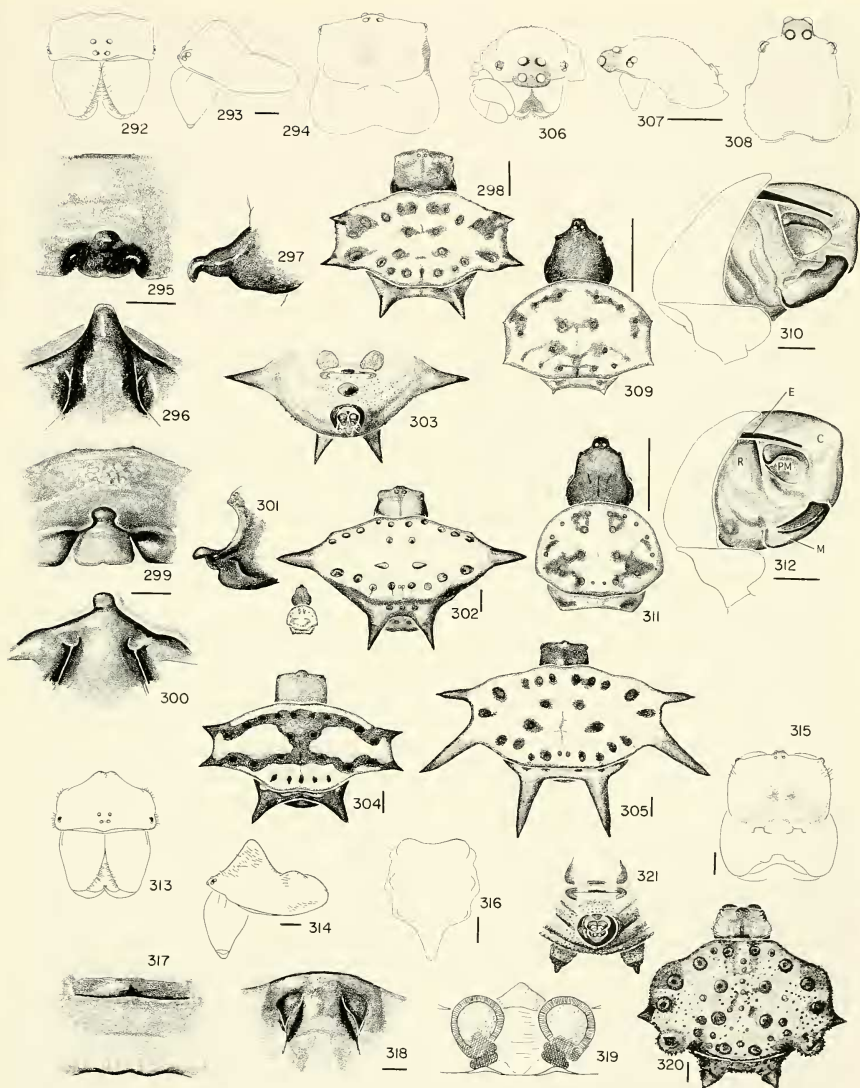
Gasteracantha cancriformis:—Sundevall, 1833: 14.

Acrosoma hexacantha Hahn, 1834: 17, pl. 106, ♀. Specimen from Brazil. NEW SYNONYMY.

Gasteracantha hexacantha:—C. L. Koch, 1838: 31, pl. 268, ♀. Female from Brazil.

Figures 292–312. *Gasteracantha cancriformis* (Linné). 292–303, female. 292, eye region and chelicerae. 293, carapace and chelicera, lateral. 294, carapace, dorsal. 295–297, 299–301, epigynum. 295, 299, ventral. 296, 300, posterior. 297, 301, lateral. 298, 302, 304, 305, dorsal. 302, with male. 303, ventral. 306–312, male. 306, eye region, chelicerae and right palpus. 307, carapace and chelicera, lateral. 308, carapace. 309, 311, dorsal. 310, 312, left male palpus. 292–294, 299–303, 306–308, 311, 312, (from Puerto Rico). 295–298, 309, 310, (from Las Lomas, Peru). 304, (from Galapagos Islands). 305, (from Baja California Sur, Mexico).

Figures 313–321. *G. camerunensis* Thorell, female. 313, eye region, chelicerae. 314, carapace, chelicerae, lateral. 315, carapace. 316, sternum. 317–319, epigynum. 317, ventral. 318, posterior. 319, dorsal, cleared. 320, dorsal. 321, abdomen, ventral.



Abbreviations. C, conductor. E, embolus. M, median apophysis. PM, paramedian apophysis. R, radix.

Scale lines. 1.0 mm; except Figures 292-294, 306-308, 313-316, 0.5 mm; genitalia, 0.1 mm.

- Gasteracantha velitaris* C. L. Koch, 1838: 33, pl. 269, ♀. Female from Brazil.
- Gasteracantha elipsoides* Walckenaer, 1841: 155. Name applied to Abbott's illustrations of the Insects of Georgia, photocoopy examined.
- Gasteracantha quinqueserrata* Walckenaer, 1841: 157. Female from Guyana, lost.
- Gasteracantha sexserrata* Walckenaer, 1841: 157. Female from Cayenne [French Guyana], lost.
- Plectana triserrata* Walckenaer, 1841: 158. Specimens from Guyana and Surinam, lost. NEW SYNONYMY.
- Plectana atlantica* Walckenaer, 1841: 167. Female from Santa Domingo [Dominican Republic], lost.
- Gasteracantha rubiginosa* C. L. Koch, 1845: 55, pl. 578. Female from Santa Domingo [Dominican Republic].
- Gasteracantha quadridens* C. L. Koch, 1845: 59, pl. 880, ♀. Female from St. Thomas, West Indies. NEW SYNONYMY.
- Gasteracantha pallida* C. L. Koch, 1845: 60, pl. 881, ♀. Specimens from unknown locality. NEW SYNONYMY.
- Gasteracantha picca* C. L. Koch, 1845: 61, pl. 882, ♀. Specimen from Brazil. NEW SYNONYMY.
- Epeira cancer* Hentz, 1850: 23, pl. 3, fig. 13, ♀. Females from South Carolina and Alabama, destroyed.
- Gasteracantha moesta* Thorell, 1859: 301. Female from St. Barthélemy, French Lesser Antilles. NEW SYNONYMY.
- Gasteracantha hilaris* Thorell, 1859: 302. Female from St. Barthélemy, French Lesser Antilles. NEW SYNONYMY.
- Gasteracantha insulana* Thorell, 1859: 302. Female from Galapagos Islands in NRMS, examined. NEW SYNONYMY.
- Gasteracantha columbiae* Giebel, 1863: 312. Black female from Colombia in Giebel Collection (Halle, Saale, Germany), lost.
- Gasteracantha kochii* Butler, 1873: 169. New name for *Gasteracantha hexacantha*.—C. L. Koch, 1838: 117, fig. 288. Female from Pará [Belém], Brazil. NEW SYNONYMY.
- Gasteracantha oldendorffi* Holmberg, 1876: 143. Female from Norte del Río Guayquiraró [Prov. Corrientes], Argentina, destroyed.
- Gasteracantha callida* O. P.-Cambridge, 1879: 284, pl. 26, fig. 7, ♀. Female holotype from Trinidad, West Indies, in HECO.
- Gasteracantha raimondii* Taczanowski, 1879: 106, pl. 1, figs. 25, 26, ♀. Female syntypes from Lima, Chorillos, and Montana de Nancha, Peru, in PAN, examined.
- Gasteracantha raimondii unicolor* Taczanowski, 1879: 107. Two females from Lima, Peru, in PAN.
- Gasteracantha proboscidea* Taczanowski, 1879: 108, pl. 1, fig. 27, ♂. Two male syntypes from Lima, Peru, in PAN, examined.
- Gasteracantha rufospinosa* Marx, 1883: 25, figs. a-f, ♀, ♂. Female and male from Crescent River, Florida [locality questionable], in USNM, lost.
- Gasteracantha elliptica* Gétaz, 1893: 105. Females from near San José, Costa Rica, lost.
- Gasteracantha maura* McCook, 1894: 210, pl. 13, fig. 12, ♀. Syntypes from California, lost.
- Gasteracantha preciosa* McCook, 1894, p. 211, pl. 14, fig. 7, ♀. Female holotype from "Mohave Desert, Ca", but probably comes from Puerto Rico, in USNM, examined. NEW SYNONYMY.
- Gasteracantha biolleyi* Banks, 1905: 20, fig. 3, ♀. Female from Cocos Island [Costa Rica], in MCZ, examined.
- Gasteracantha kochii* var. *joinvillensis* Strand, 1915: 115. Two female syntypes from Joinville, St. Catharina [Est. Santa Catarina], Brazil, in SMF. NEW SYNONYMY.
- Gasteracantha mascula* Strand, 1915: 119. Male from Haitien, Haiti, in SMF, examined. NEW SYNONYMY.
- Gasteracantha comstocki* Mello-Leitão, 1917: 91. Female from Goiás and Belo Horizonte [Est. Minas Gerais, Brazil], lost. NEW SYNONYMY.
- Vibradellus carolinus* Chamberlin, 1925: 214. Male holotype from South Carolina in MCZ, examined.
- Gasteracantha tetracantha*.—Petrunkevitch, 1930: 253, figs. 104-107, ♀, ♂. Roewer, 1942: 950. Bonnet, 1957: 1970.
- Gasteracantha cancriformis*.—Roewer, 1942: 949. Bonnet, 1957: 1945. Levi, 1978: 437, figs. 69-85, ♀, ♂.

Note. No attempt was made to examine all the type specimens.

Description. Female from Depto. Las Lomas, Peru (CAS). Eyes subequal. Anterior median eyes about their diameter apart. Posterior median eyes about their diameter apart. Ocular quadrangle about square. Height of clypeus equals to 0.7 diameter of anterior median eye. Total length 4.3 mm. Carapace 2.2 mm long, 2.1 wide in thoracic region, 1.8 wide in eye region. First femur 1.7 mm, patella and tibia 1.7, metatarsus 1.0, tarsus 0.4. Second patella and tibia 1.6 mm, third 1.1. Fourth femur 2.1 mm, patella and tibia 1.7, metatarsus 1.1, tarsus 0.4.

Male from Depto. Las Lomas, Peru (CAS). Posterior median and lateral eyes 0.8 diameter of anterior medians. Anterior median eyes 0.8 diameter apart. Posterior median eyes 1 diameter apart. Median ocular quadrangle slightly wider in front than behind. Endite without tooth. Palpal patella without macroseta. First coxa without

hook. Abdomen as in female. Total length 2.4 mm. Carapace 1.18 mm long, 0.96 wide in thoracic region, 0.73 wide in eye region. First femur 0.78 mm, patella and tibia 0.85, metatarsus 0.46, tarsus 0.36. Second patella and tibia 0.66 mm, third 0.47. Fourth femur 0.75 mm, patella and tibia 0.68, metatarsus 0.39, tarsus 0.32.

Variation. Specimens come in various colors, white, yellow, orange, red, or sometimes all black with black patches on light (Fig. 298) or bands (Fig. 304) on the abdomen. The most distinctive are specimens from Puerto Rico and some of the Antilles that have only four spines (Figs. 302, 303), having lost the most anterior pair. But specimens from Bahamas and Hispaniola that look like the specimens from Puerto Rico have a minute to small anterior pair of spines. North American males have a body that resembles the male from Puerto Rico (Fig. 311); South American males usually have six points on the abdomen (Fig. 309). (There are only a few males from South America in North American collections, and no attempt was made to borrow specimens from South America.) The variability in color and form of the spines has resulted in a proliferation of names and descriptions and numerous synonyms. Despite the many synonymies, there are intermediates between the forms and the genitalia show little variation.

Figures 295–298, 309, and 310 were made from specimens from Higuierón, Las Lomas [Depto. Piura], Peru (CAS), Figures 292–294, 299–303, 306–308, 311, and 312 from specimens from Jayuya, Puerto Rico (MCZ), Figure 304 from a specimen from Galapagos Islands (MCZ), and Figure 305 from Desierto del Vixcaino, La Bocana, Baja California Sur, Mexico (MLJ, MCZ).

Diagnosis. The shape of the body with three (or sometimes six) spines (Figs. 298, 302, 304, 305) and the shape of the male body (Figs. 309, 311) separate *G. cancriformis* from all other American orb weavers. The female is separated from other female *Gasteracantha* species by its epi-

gynum with a median posterior knob in ventral view (Figs. 295, 299) and posteriorly a subtriangular median plate separated dorsally and coming to, almost joining, at the knob ventrally (Figs. 296, 300). The male is separated by its palpus with an almost circular paramedian apophysis (Fig. 310, PM in Fig. 312), median apophysis with a distal knob (M in Fig. 312), the even slope of the embolus (Fig. 310, E in Fig. 312), and a transparent conductor (C in Fig. 312).

Distribution. This is one of the most common tropical and subtropical American spiders occurring in the north from North Carolina to Oklahoma and southern California (Levi, 1978). The most southern records (in North American collections) are from Paraguay and from Tucuman, Argentina. No attempt was made to get the southernmost collections. The species also occurs in Hawaii and on the Galapagos Islands. It is found in semiarid or dry habitats, not in dark, wet forests.

Gasteracantha camerunensis

Thorell

Figures 313–321

Gasteracantha camerunensis Thorell, 1899: 65. Female holotype from Cameroon, lost (N. Scharff, personal communication).

Gasteracantha brevispina camerunensis:—Bonnet, 1957: 1945.

Gasteracantha batesi:—Roewer, 1942: 935.

Description. Female from Venezuela. Carapace dark orange to black with white setae on each side. Chelicerae orange-brown. Labium, endites, sternum orange to brown. Coxae, legs orange, third and fourth with brown rings. Abdomen light orange with black patches and some anterior median white pigment spots dorsally (Fig. 320). Carapace with cephalic region high (Figs. 313–315). Sternum with humps at first and second coxae and with median posterior projection (Fig. 316). Eyes subequal in size. Anterior median eyes 1 diameter apart. Posterior median eyes 1.7 diameters apart. Ocular quadrangle wider behind than in front. Abdomen with three

pairs of large spines (Fig. 320). Total length 9.0 mm. Carapace 3.4 mm long, 3.2 wide in thoracic region, 2.6 wide behind posterior eyes, 2.9 widest in cephalic region. First femur 2.3 mm, patella and tibia 2.6, metatarsus 1.3, tarsus 0.9. Second patella and tibia 2.5 mm, third 1.5, fourth 2.5. Abdomen 6.9 mm long, 9.5 wide.

Note. We assume that the single specimen found, a rare African species, represents an error of labeling locality. The rarity of this species in Africa and the remoteness of the Venezuelan locality where it was allegedly found make it unlikely that this is an introduced species.

Specimen Examined. VENEZUELA Amazonas: Rio Barío [Río Baría], betw. Pico de Neblina and San Carlos, Venezuela, 7-9 May 1984, 1 ♀ (J. Cracraft, AMNH).

Enacrosoma Mello-Leitão

Enacrosoma Mello-Leitão, 1932: 78. Type species *Epeira anomala* Taczanowski, by original designation. Neave, 1939b: 733. The generic name is neuter (Bonnet, 1956: 1654).

Note. Simon (1884) established the genus *Glyptogona* and made the Mediterranean *Epeira sextuberculata* Keyserling the type species. Later, Simon (1895b: 867) re-described the genus but illustrated the description with the dorsal view of the American *Glyptogona sexlobata* Simon (= *E. anomala*), a different species, but again listed *G. sextuberculata* Keyserling as the type species.

Mello-Leitão (1932), when establishing the genus *Enacrosoma*, made *Epeira anomala* the type species and also placed *Acosoma quadrituberculatum* Simon in the genus. Both species had been placed in the genus *Micrathena* by Simon (1895b: 862).

Did Simon misidentify the Mediterranean Keyserling species? It is certain that this was not the case, as determined female and male specimens of the Keyserling species were loaned to me from the Paris museum, and Keyserling's (1863) illustrations of the epigynum and abdomen of this species match those of the deter-

mined specimens. The catalogs of both Roewer (1942) and Bonnet (1957) kept most American species in *Glyptogona*. *Glyptogona* is illustrated with Figures 360-363.

Diagnosis. The abdomen is wider than long, with about five pairs of lateral humps and sclerotized spots (Figs. 329, 330, 338, 342, 343, 357). The spots may be tiny tubercles, each bearing a seta, distinguishing *Enacrosoma* from most other araneid genera including *Colphepeira* Archer (Levi, 1978). Endites, labium, sternum, and legs are tuberculate. The female (but not male) has the fourth femur as long or longer than the first, but in total length the first leg exceeds the fourth. The sternum, as in *Xylethrus*, has the posterior end truncate (Fig. 325), sometimes hidden by tubercles. The female differs from those of *Encyosaccus*, *Xylethrus*, and *Gasteracantha*, which also have the fourth femur longer than the first, by the shape of the abdomen, by the small size, and by having the cephalic region of the carapace narrower than the thoracic region (Figs. 324, 333).

The male differs from those of other genera by the shape of the abdomen (Fig. 338), which is similar to that of the female (Fig. 330). The male of *Enacrosoma* (also *Colphepeira* and *Glyptogona*) differs from males of other genera by being only slightly smaller than the female (Figs. 330, 338) and by the narrow cephalic region (Figs. 324, 333) and having the first femur longer than fourth. As in other araneid genera in which the female is only slightly larger, the male has a tooth on the endite (ET in Fig. 331), a hook on the first coxa (CXH in Fig. 331), and a tiny groove on the second femur (GR in Fig. 334), but both hook and matching groove are small.

Description. Small spiders, less than 5 mm total length. Coloration white and orange with patches of brown and black. Thoracic region of carapace usually brown. Clypeus light. Chelicerae, and sternum with brown patches, sternum with brown margin. Legs orange with brown rings. Dorsum of abdomen with paired, indis-



Plate 2. Upper, web of *Enacrosoma anomalum*, from Madre de Dios Dept., Peru, diameter unknown. Lower left, close up of web, spider among debris, spider about 3 mm total length (photos D. Silva D.). Lower right, female *E. frenca*, from Chiapas State, Mexico, total length about 3 mm (photo W. Maddison).

tinged, darker patches and darker spots (Fig. 330, 343, 349, 357); venter without distinct pattern. Carapace with scattered, short, white setae.

Posterior median eyes slightly smaller than anterior medians, diameter of laterals 0.5 to 0.7 diameter of anterior median eyes. Anterior median eyes 0.5 to 0.8 their diameter apart, 1 to 1.8 diameters from laterals. Posterior median eyes 0.8 to 1.5 diameters apart, 1.8 to 3 diameters from laterals. Ocular trapezoid almost square, slightly narrower behind than in front (Figs. 324, 333). Height of clypeus equals 0.8 to 1 diameter of anterior median eye (Figs. 322, 331). Carapace with fine tubercular texture. Endites, labium, sternum

tubercular. Proximal leg articles tubercular. First and second femora with three to eight median ventral tubercles in a row that form bases for short setae (Fig. 334).

Abdomen wider than long, with about five pairs of humps, additional smaller humps, and sclerotized spots (Figs. 329, 330, 342, 343, 356, 357). A sclerotized ring around spinnerets (Fig. 326), its proximal edge indistinct. Ring with two lobes at 4 and 8 hr of circle (Fig. 326). The male is like the female and not much smaller.

Genitalia. Epigynum with a median lobe tipped by a median secondary lobe (Figs. 327, 328, 339, 340).

Palpus with conductor in middle of tegulum (C in Figs. 336, 345), with an ex-

tension that probably is a paramedian apophysis (PM in Figs. 336, 345), most distinct as a round structure in *E. anomalum*. Large median apophysis (M in Figs. 336, 345) and a terminal apophysis (A in Figs. 336, 337, 345). Embolus and terminal apophysis may be complex structures (Figs. 336, 337). Palpal patella with only one weak macroseta.

Natural History. The orbweb is close to horizontal, tightly meshed with the spider resting during the day in a retreat made of bits of debris and plant parts, at the edge of the web (Pl. 2). A retreat of *E. javium*, kept with the specimen, is 10–15 mm long but may have been torn during collecting. Attached between and on the debris are numerous early instar spiderlings. An eggsac of *E. multilobatum* was 5 mm long, about 8 mm wide, and was covered with debris, as was the retreat. The spiders occur in secondary forest and may be common (in Colombia, W. Eberhard, letter Oct. 1990). Some spiders were collected at night in Peru, one by fogging vegetation.

Relationship. The elongate fourth femur of the female is probably a synapomorphy of *Encyosaccus*, *Hypognatha*, and other genera belonging to the *Gasteracantha* group of genera. The similar size of male and female and the palpus resembling those of *Alpaida* and *Wagneriana* are probably plesiomorphic features.

Encacosoma is probably not close to *Glyptogona*. *Glyptogona*, described from Syria and fairly common in southeastern Europe, has an annulated scape of the epigynum (Figs. 359, 360), and the male has a large round terminal apophysis, facing the mesal surface of the palpus (A in Figs. 364, 365).

Distribution. There are only six species, all American; four of the six species are Central American (Map 5).

Misplaced Species. Nicolet (1849) named species in *Gasteracantha* that have been placed in *Glyptogona* together with the species here placed in *Encacosoma*. All Nicolet's species seem to belong in *Phor*

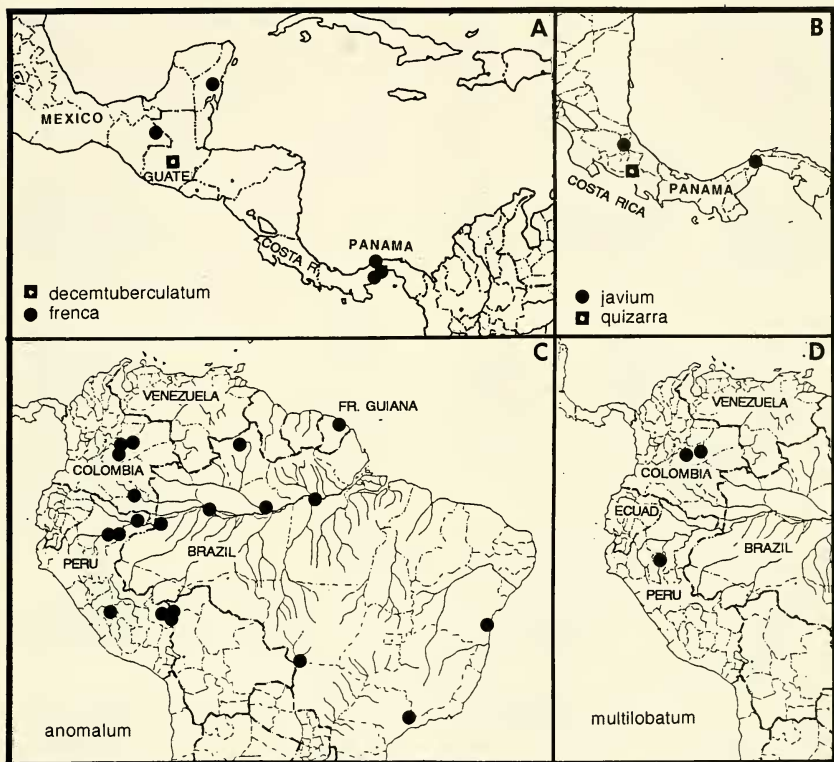
roncidia (Theridiidae). Simon (1894: 556) placed *Gasteracantha scutata*, *G. gayi*, and *G. pennata* in *Ulesanis* (= *Phoroncidia*) but later in the same volume (1895b: 867) referred to them in *Glyptogona*. Sedgwick (1973: 354) found specimens of two Nicolet species, *G. pennata* and *G. variabilis*, and placed them in *Phoroncidia*. Others are *Gasteracantha fumosa*, *G. pallida*, *G. spissa*, and *G. umbrosa*, all here placed in *Phoroncidia* (NEW COMBINATIONS). A specimen of *Gasteracantha fumosa* was examined. Roewer (1942: 691) replaced the name *G. pallida* Nicolet, a homonym of *G. pallida*, C. L. Koch, 1845, with *nicoleti*.

Simon described *Acrosoma quadriloberculatum* (1876: lxxviii) and later placed it in *Micrathena* (1895b: 862). Mello-Leitão (1932: 75, 77) placed the species in *Encacosoma*. In the catalogs (Roewer, 1942; Bonnet, 1957), it appears in *Encacosoma*, although the type is lost (in the museum in Troyes, France), and nobody knows what the species is.

KEY TO FEMALE *ENCACOSOMA*

Female of *E. decentuberculatum* is not known.

- 1. Female from South America (Maps 5C, D) 2
- Female from Central America (Maps 5A, B) 3
- 2(1). Humps of the abdomen spherical (Figs. 356, 357); sclerotized epigynum about as long as long (Figs. 354, 355); total length 4–5 mm *multilobatum*
- Humps conical, pointed (Figs. 342, 343); epigynum wider than long (Figs. 339, 340); total length 2.5–3.5 mm *anomalum*
- 3(1). Thoracic region of carapace with a light V-shaped mark (Fig. 330); median plate of epigynum, in posterior view, with almost parallel sides (Fig. 328) *frenca*
- Thoracic region of carapace marked otherwise (Figs. 349, 353); median plate of epigynum narrower dorsally than ventrally (Figs. 347, 351) 4
- 4(3). Thoracic region of carapace light in median area (Figs. 349); epigynum wider than long (Figs. 346, 347) *javium*
- Thoracic region of carapace with four indistinct, light patches (Fig. 353); epigynum longer than wide (Figs. 350, 351) *quizarra*

Map 5. Distribution of *Enacrosoma* species.

KEY TO ENACROSOMA MALES

The males of *E. javium*, *E. multilobatum*, and *E. quizarra* are not known.

1. Carapace with light V-shaped mark (Fig. 335); embolus consisting of two claw-shaped structures (Fig. 335, E, d in Fig. 336); Central America (Map 5A) *frenca*
- Carapace marked otherwise; embolus otherwise 2
- 2(1). A black pointed portion of terminal apophysis behind a more transparent section (Fig. 344, A in Fig. 345); median apophysis almost square (Fig. 344, M in Fig. 345); South America (Map 5C) *anomalum*
- Terminal apophysis otherwise (Fig. 358);

median apophysis otherwise (Fig. 358); Guatemala (Map 5A) ... *decmntuberculatum*

***Enacrosoma frenca* new species**
Figures 322–338; Map 5A

Holotype. Female holotype, one female, two male, and one immature paratypes from France Field, Canal Zone [Colón Prov.], Panama, Aug. 1939 (A. M. Chickering), in MCZ. The specific name is an arbitrary combination of letters.

Description. Female holotype. Total length 2.7 mm. Carapace 1.10 mm long, 1.05 wide in thoracic region, 0.63 wide in cephalic region. First femur 1.00 mm, pa-

tella and tibia 1.17, metatarsus 0.49, tarsus 0.37. Second patella and tibia 1.07 mm, third 0.65. Fourth femur 1.00, patella and tibia 0.91, metatarsus 0.45, tarsus 0.37.

Male paratype. Second tibia as thick as first. Total length 1.8 mm. Carapace 1.14 mm long, 0.99 wide in thoracic region, 0.56 wide in cephalic region. First femur 0.90 mm, patella and tibia 1.07, metatarsus 0.46, tarsus 0.36. Second patella and tibia 0.94 mm, third 0.61. Fourth femur 0.83 mm, patella and tibia 0.74, metatarsus 0.39, tarsus 0.27.

Note. Males and females were collected together.

Variation. Total length of females 2.3 to 3.1 mm, males 1.8 to 2.2 mm. The illustrations were made from the female holotype and male paratype.

Diagnosis. *Enacrosoma frenca* differs from other species by the distinct light V-shaped mark on the the thoracic region of the carapace (Figs. 330, 338). The epigynum has a secondary median lobe that is longer than wide (Fig. 327), whereas that of *E. anomalum* is wider than long (Fig. 339). The embolus of the palpus appears to have a pair of claws (Fig. 335, E in Fig. 336), whereas that of *E. anomalum* is hidden below the terminal apophysis (Fig. 345). The median apophysis of *E. frenca* is elongate (Fig. 335, M in Fig. 336), whereas that of *E. anomalum* is square (Fig. 344, E in Fig. 345). *Enacro-*

soma frenca has the most pointed humps on the abdomen.

Natural History. Specimens have been found in roadside bushes of tropical rain forest in Chiapas, Mexico.

Specimens Examined. MEXICO *Quintana Roo:* San Felipe de Bacalar, 8 July 1993, 1♂ (G. Alayón, CIQRO). *Chiapas:* 105 km SE Palanque on road to Bonampak, 8, 9 July 1983, 1♀ (W. Maddison, MCZ). PANAMA *Panamá:* Arraiján, July 1950, 1♀ (A. M. Chickering, MCZ); Barro Colorado Island, July 1936, 3♀, 3♂, 1 imm., Aug. 1939, 9♀, 7♂, 15 imm., June 1950, 1♀, 1♂, 1 imm., July 1950, 2♀, 1♂, 2 imm.; Experimental Gardens, July 1954, 1♂; Fort Randolph, 13 Aug. 1936, 1♀, 1 imm.; Fort Sherman, Aug. 1939, 1♀; Summit, July 1950, 1♂ (all A. M. Chickering, MCZ).

Enacrosoma anomalum (Taczanowski) Figures 339–345; Map 5C

Epeira anomala Taczanowski, 1873: 144, pl. 5, fig. 19, ♀. Two female, two male, and an immature syntypes from Cayenne, French Guiana, in PAN, examined.

Inca branickii Taczanowski, 1879: 105. Male paralecotype from Amable María [Depto. Junín], Peru, in PAN, not female lectotype (= *Aspidolasius branickii*).

Gasteracantha anomala:—Taczanowski, 1879: 108.

Xylethrus superbus Simon, 1895b: 895. Male paralecotype from São Paulo [São Paulo de Olivença, Amazonas State], Brazil, in MNHN, not female lectotype.

Micrathena anomala:—Simon, 1895b: 862.

Glyptogona sexlobata Simon, 1895a: 160. Female holotype from Pebas [Depto. Loreto], Peru, in MNHN, examined. Roewer, 1942: 891. Bonnet, 1957: 1999. NEW SYNONYMY.

Glyptogona leprosa Simon, 1897: 471. Male holotype

Figures 322–338. *Enacrosoma frenca* n. sp. 322–330, female. 322, eye region and chelicerae. 323, carapace and chelicera, lateral. 324, carapace. 325, sternum and labium. 326, spinnerets. 327, 328, epigynum. 327, ventral. 328, posterior. 329, abdomen, lateral. 330, dorsal. 331–338, male. 331, eye region, chelicerae and right palpus. 332, carapace and chelicera, lateral. 333, carapace, dorsal. 334, second left leg from anterior. 335–337, left palpus. 335, mesal. 336, 337, expanded. 336, mesal. 337, embolus and terminal apophysis, dorsal. 338, dorsal.

Figures 339–345. *E. anomalum* (Taczanowski). 339–343, female. 339–341, epigynum. 339, ventral. 340, posterior. 341, posterior, cleared. 342, abdomen, lateral. 343, dorsal. 344, 345, male palpus. 344, mesal. 345, mesal, expanded.

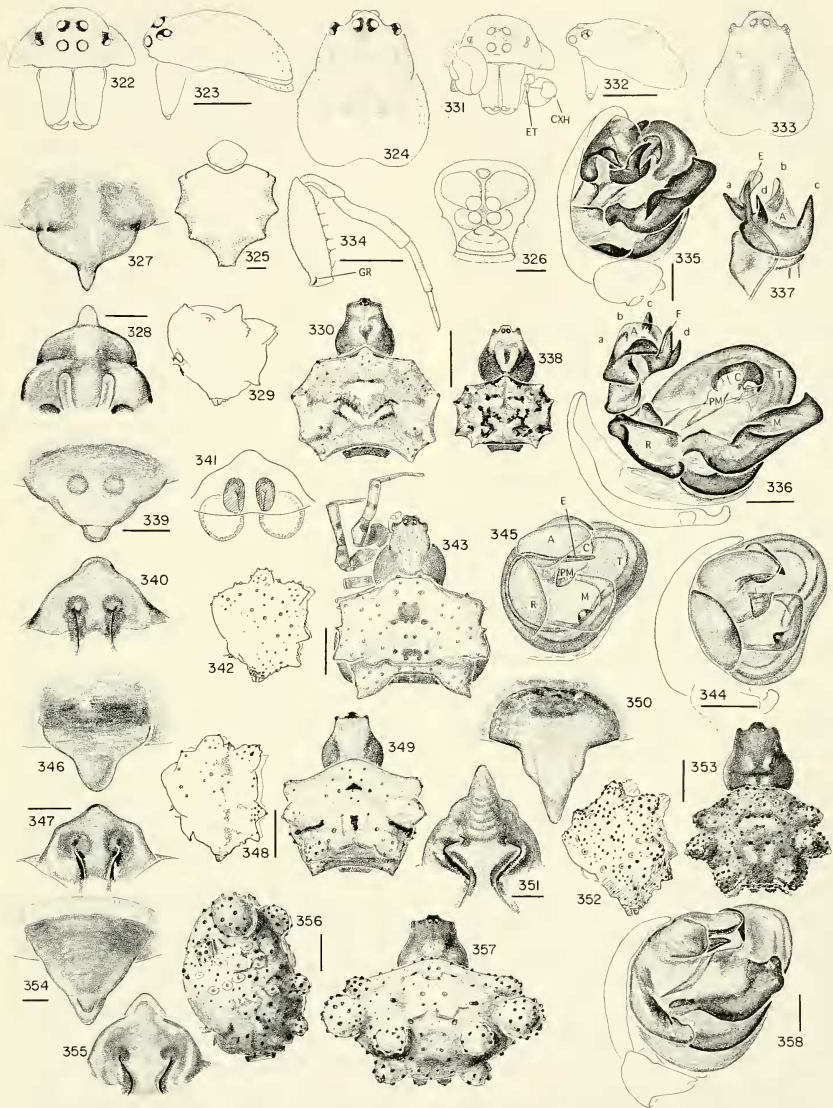
Figures 346–349. *E. javium* n. sp., female. 346, 347, epigynum. 346, ventral. 347, posterior. 348, abdomen, lateral. 349, dorsal.

Figures 350–353. *E. quizzarra* n. sp., female. 350, 351, epigynum. 350, ventral. 351, posterior. 352, abdomen, lateral. 353, dorsal.

Figures 354–357. *E. multilobatum* (Simon), female. 354, 355, epigynum. 354, ventral. 355, posterior. 356, abdomen, lateral. 357, dorsal.

Figure 358. *E. decemtuberculatum*. (O. P.-Cambridge). male, 358, palpus.

Abbreviations. A, terminal apophysis. C, conductor. CXH, coxal hook. E, embolus. ET, endite tooth. GR, groove. M, median apophysis. PM, paramedian apophysis. R, radix. T, tegulum. a, b, c, d letters to compare position of Figures 336, 337.



Scale lines. 1.0 mm; except Figures 322-324, 331-334, 0.5 mm; Figures 325, 326 and genitalia 0.1 mm.

from Venezuela in MNHN, examined. Roewer, 1942: 891. Bonnet, 1957: 1999. NEW SYNONYMY.

Enacrosoma anomalum.—Mello-Leitão, 1932: 78. Roewer, 1942: 952. Bonnet, 1956: 1654.

Description. Female from Santarém. Carapace orange, sides of thoracic region brown. Abdomen white, black, gray on colorless background, without well-defined spots (Fig. 346). Venter of abdomen mostly white spots with some black. Total length 3.3 mm. Carapace 1.43 mm long, 1.22 wide in thoracic region, 0.78 wide in cephalic region. First femur 1.23 mm, patella and tibia 1.40, metatarsus 0.60, tarsus 0.44. Second patella and tibia 1.24 mm, third 0.87. Fourth femur 1.30 mm, patella and tibia 1.17, metatarsus 0.52, tarsus 0.42.

Male from Santarém. Total length 1.9 mm. Carapace 1.04 mm long, 0.92 wide in thoracic region, 0.49 wide in cephalic region. First femur 1.01 mm, patella and tibia 1.09, metatarsus 0.47, tarsus 0.36. Second patella and tibia 0.91 mm, third 0.74. Fourth femur 0.91 mm, patella and tibia 0.83, metatarsus 0.39, tarsus 0.30.

Note. Males and females were collected together.

Variation. Total length of females 2.6 to 3.7 mm, males 1.8 to 2.5. The illustrations were made from a female from Santarém (Figs. 339–342), a syntype (Fig. 343), and a male from Santarém (Figs. 344, 345).

Diagnosis. The sclerotized part of the epigynum is wider than long and the small distal lobe, unlike that of *E. frenca* (Fig. 327), is wider than long (Fig. 339), and the posterior median plate has sides that are almost parallel (Fig. 340). The male differs by having a sclerotized lobe in the palpus whose distal tip is visible under the terminal apophysis (Fig. 344, A in Fig. 345) and a median apophysis (Fig. 344; M in Fig. 345) which is almost square.

Natural History. Specimens were collected in forest in Santarém.

Specimens Examined. COLOMBIA *Meta*: Lomalinda nr. Puerto Lleras, 3°18'N, 73°22'W, Sept. 1987, 1♀, 1♂, Nov. 1987, 1♀, 3 imm. (B. T. Carroll, CAS); 15 km SW Puerto Lopez, 200 m, Aug. 1978, 1♀ (W.

Eberhard, MCZ); Carimagua, 20 km N Río Muco, no date, 2♀, Oct. 1973, 3♀ (W. Eberhard, MCZ). *Amazonas*: Araracuara, 270 m, 16 Mar. 1988, 1♀ (C. Valdeerrama, CV). PERU *Loreto*: Cocha San Martín, Río Samiria, fogging, 8 May 1990, 1♀ (D. Silva D., MUSM), fogging, 20 May 1990, 1♂ (T. Ervin, D. Silva D., MUSM); Genaro Herrera, 04°55'S, 73°45'W, 1♀ (D. Silva D., MUSM). *Junín*: Amable María, 1♀ (Taczanowski coll., PAN). *Madre de Dios*: Albergue Cuzco Amazonico, 12°33'S, 69°03'W, 12 June 1989, 1♀, 1 July 1989, 1♀, 23 Feb. 1990, 1♀, 4 imm., 8 Mar. 1990, 1♀ (D. Silva D., MUSM); Zona Reservada Tambopata, 12°50'S, 69°17'W, 20, 22 July 1987, 2♀ (D. Silva D., MUSM); Zona Reservada Pakitza, 25 Apr. 1991, 1♀, 1 imm., 7 May 1991, 1♀, 13 May 1991, 2♀, 6 Oct. 1991, 1♂ (D. Silva D., MUSM). BRAZIL *Pará*: Santarém, 1♀, 1♂ (BMNH 97.9.20.260–72). *Roraima*: Maracá, 24 Mar. 1987, 1♀ (A. A. Lise, INPA); Ilha de Maracá, 4 Dec. 1987, 1♂ (A. A. Lise, INPA), 31 Jan.–24 Feb. 1992, 3♀, 3♂, 7 imm. (A. B. Bonaldo, MCP 1886); Ilha de Maracá, Rio Uraricoera, 21 Mar. 1987, 1♀ (A. A. Lise, MCN 25560); 8 Dec. 1987, 1♀ (E. H. Buckup, MCN 25561). *Amazonas*: Manaus, 14 Mar. 1987, 1♀, 1♂ (A. A. Lise, MCN 25567); Estação Ecológica de Mimirauá, Tefé, 9–13 Oct. 1993, 1♀ (S. H. Borges, MCN 22965). *Bahia*: Fazenda Almada Uruçuca, 26 Nov. 1977, 1♂ (J. S. Santos, MCN 10292). *Mato Grosso*: Pantanal, 4–10 Aug. 1992, 1♀, 1♂, 4 imm. (A. A. Lise, G. A. Brault, MCP 2334). *São Paulo*: Capital, Agua Funda, 13 July 1941, 1♂ (B. M. Soares, Brandas, MZSP 7476).

Enacrosoma javium new species

Figures 346–349; Map 5B

Holotype. Female holotype from Finca La Selve, 50 m, near Puerto Viejo, Heredia, Costa Rica, June 1982 (W. Eberhard, no. TL 32–5), in MCZ. The specific name is an arbitrary combination of letters.

Description. Female holotype. Carapace orange, sides of thoracic region brown, center light (Fig. 349) or with a median brown patch on orange. Total length 3.6 mm. Carapace 1.55 mm long, 1.34 wide in thoracic region, 0.77 wide in cephalic region. First femur 1.40 mm, patella and tibia 1.48, metatarsus 0.70, tarsus 0.44. Second patella and tibia 1.40 mm, third 0.96. Fourth femur 1.41 mm, patella and tibia 1.26, metatarsus 0.65, tarsus 0.42.

Variation. Total length of females 2.6 to 3.6 mm. The illustrations were made from the holotype.

Diagnosis. This species differs from others by having the median thoracic region light (Fig. 349), sometimes with a me-

dian dark patch. The sclerotized region of the epigynum is wider than long, the median distal lobe is as wide as long (Fig. 346), and the distal lobe is relatively larger than that of *E. frenca* (Fig. 327) or *E. anomalum* (Fig. 339). The humps of the abdomen (Fig. 349) are more swollen than those of *E. frenca*.

Paratypes. COSTA RICA *Heredia*: La Selva, nr. Puerto Viejo, Feb. 1981, 1♀ (W. Eberhard, 2197, MCZ).

Specimens Examined. PANAMA *Panamá*: Barro Colorado Island, 9 Mar. 1973, 1♀ (Y. Lubin, H. Levi); Sept. 1975, 1♀, Oct. 1975, 1♀ (W. Eberhard, MCZ).

Enacrosoma quizarra new species

Figures 350–353; Map 5B

Holotype. Female holotype, five female paratypes from near Quizarra, 6 km E San Isidro del General, 750 m, Puntarenas Prov., Costa Rica, May 1989 (W. Eberhard 3537) in MCZ. The specific name is a noun in apposition after the locality.

Description. Female holotype. Carapace dark brown, posteriorly with two pairs of light orange patches in median (Fig. 353). Total length 3.8 mm. Carapace 1.86 mm long, 1.56 wide in thoracic region, 1.01 wide in cephalic region. First femur 1.47 mm, patella and tibia 1.70, metatarsus 0.85, tarsus 0.55. Second patella and tibia 1.59 mm, third 1.10. Fourth femur 1.57 mm, patella and tibia 1.46, metatarsus 0.85, tarsus 0.52.

Note. The illustrations were made from the female holotype.

Diagnosis. This species differs from other Central American *Enacrosoma* by having the tubercles of the abdomen more rounded. It differs from all other *Enacrosoma* species by having the sclerotized portion of the epigynum longer than wide (Figs. 350, 351) and the posterior median plate trapezoid in shape, the dorsal width narrower than the ventral width (Fig. 351).

Specimens Examined. COSTA RICA *Puntarenas*: Quizarro, 9.6 km E San Isidro del General, 750 m, 11 Oct. 1981, 1♀ (W. Eberhard FN 3–4A, MCZ).

Enacrosoma multilobatum (Simon)

new combination

Figures 354–357;
Map 5D

Glyptogona multilobata Simon, 1897: 472. Female holotype from Tarapoto [Depto. San Martín], Peru, in MNHN no. 9729, examined. Roewer, 1942: 891. Bonnet, 1957: 1999.

Description. Female from near El Porvenir, Colombia. Carapace dark brown with several narrow, irregular light lines in middle of thoracic region. Total length 5.0 mm. Carapace 2.2 mm long, 1.9 wide in thoracic region, 1.1 wide in cephalic region. First femur 1.9 mm, patella and tibia 2.1, metatarsus 1.1, tarsus 0.6. Second patella and tibia 2.0 mm, third 1.3. Fourth femur 2.1 mm, patella and tibia 1.8, metatarsus 1.1, tarsus 0.6.

Note. The illustrations were made from female specimens from Colombia.

Diagnosis. This species is larger than the other *Enacrosoma* and has the tubercles of the abdomen almost spherical (Figs. 356, 357). The epigynum is triangular, about as wide as long (Fig. 354), and the posterior median plate is narrower dorsally than ventrally (Fig. 355).

Specimens Examined. COLOMBIA *Meta*: Finca Chenevo, 20 km N Río Muco, 20 km S El Porvenir, 1978, 1♀ (W. Eberhard, MCZ); Hacienda Mozambique, 15 km SW Puerto Lopez, 200 m, Aug. 1978, 1♀ (W. Eberhard, MCZ).

Enacrosoma decemtuberculatum

(O. P.-Cambridge) new combination

Figure 358; Map 5A

Cyrtarachne decemtuberculata O. P.-Cambridge, 1889: 59, pl. 4, fig. 4, ♂. Male holotype from Guatemala in BMNH no. 1905.4.28.3222, examined. Keyserling, 1892: 57, pl. 3, fig. 45, ♂.

Glyptogona decemtuberculata.—F. P.-Cambridge, 1904: 523. Roewer, 1942: 891. Bonnet, 1957: 1998.

Description. Male. Carapace dark brown, with a pair of light streaks on posterior slope of thoracic region underneath abdomen. Sternum brown, lighter anterior in center. First femur brown, otherwise ringed brown and yellowish. Abdomen with brown, black, gray spots and patches,

a pigmentless patch between posterior tubercle and spinnerets. Abdomen almost spherical, with setose humps. Total length 3.0 mm. Carapace 1.6 mm long, 1.5 wide in thoracic region, 0.8 wide in cephalic region. First femur 1.4 mm, patella and tibia 1.5, metatarsus 0.8, tarsus 0.5. Second patella and tibia 1.3 mm, third 0.9. Fourth femur 1.3, patella and tibia 1.2, metatarsus 0.8, tarsus 0.5.

Note. This may be the male of *E. qui-zarra*.

Diagnosis. The shape of the median apophysis, embolus, and terminal apophysis (Fig. 358) separate this species from *E. frenca* and *E. anomalum*.

Glyptogona Simon

Glyptogona Simon, 1884: 326. Type species, designated by Simon, is *Epeira sextuberculata* Keyserling, 1863. The gender of the name is feminine (Bonnet, 1957: 1998).

Diagnosis. Unlike that of other araneids, the abdomen of *Glyptogona* (Fig. 362) is about the same shape as that of *Colphepeira* Archer, 1941 (Levi, 1978, fig. 1) and, as in *Colphepeira*, but unlike that of *Enacrosoma*, it lacks sclerotized spots and sclerotized ring around spinnerets. Unlike both *Colphepeira* and *Enacrosoma*, its clypeus is high, about 2 diameters or more of the anterior median eye. All three genera have tuberculate sternum and coxae. Unlike *Enacrosoma*, *Glyptogona* and *Colphepeira* have the fourth femur and fourth leg shorter than the first.

The males, in *Colphepeira* and *Enacrosoma*, are only slightly smaller than females. As in *Colphepeira* (Levi, 1978, fig. 9), the epigynum has an annulate scape (Figs. 359–361). The male, as in both other genera, has only one patellar macroseta. The palpus resembles that of *Colphepeira* (Levi, 1978, figs. 12–15, and see below), but the embolus is twisted with the terminal apophysis and is positioned distally from the terminal apophysis (A, E in Figs. 363–365). The similarities between *Colphepeira* and *Glyptogona* were overlooked

when I worked on *Colphepeira* (Levi, 1978).

Distribution. *Glyptogona sextuberculata* is eastern Mediterranean in distribution, and the only other species in the genus is *G. duriuscula* Simon (not examined) from Sri Lanka.

Glyptogona sextuberculata (Keyserling)

Figures 359–365

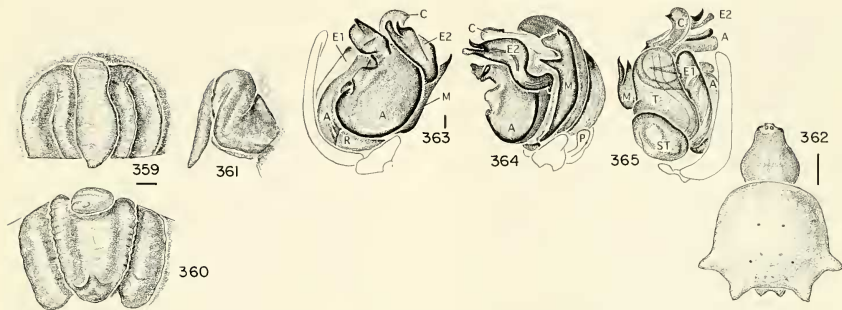
Epeira sextuberculata Keyserling, 1863: 381, pl. 10, ♀. Female holotype from Dalmatia, not examined.
Glyptogona sextuberculata:—Simon, 1884: 326; 1895b: 867. Roewer, 1942: 891. Bonnet, 1957: 1999. Levy, 1985: 50, fig., ♀.

Note. The genitalia have not been illustrated since Keyserling's original description of a female. Levy (1985) has a color photograph of a female.

Description. Female. Height of clypeus equals 2 diameters of anterior median eye. Sternum, coxae tubercular. Sternum pointed. Small row of tubercles along venter of first femur. Total length 5.5 mm.

Male. Height of clypeus equals 2.5 diameters of anterior median eye. Large en-dite tooth and hook on first coxa with matching groove on second femur. First femur with ventral tubercles. Leg lengths 1, 2, 4, 3. First tibia with many macrosetae on anterior, few on second. Total length 4.4 mm.

Genitalia. The conductor of the male palpus sits on the margin of the tegulum in the male palpus (C in Figs. 363–365) and has a distal tooth (also in *Colphepeira*); the median apophysis (M in Fig. 364) has large spines resembling those of the *Aranes* palpus. The embolus and terminal apophysis are complex structures and are twisted so the embolus seems to originate as a branch from the terminal apophysis, rather than the reverse. The embolus originates from the most proximal end of the terminal apophysis, close to the radix (R in Fig. 363) and is an upright post (E1 in Fig. 365), having a distal transverse spine and more proximally a transverse stalk (both spine and stalk are hidden by



Figures 359–365. *Glyptogona sextuberculata* (Keyserling) (from the eastern Mediterranean region). 359–362, female. 359–362, epigynum. 359, ventral. 360, posterior. 361, lateral. 362, dorsal. 363–365, male, left palpus. 363, mesal. 364, ventral. 365, dorsal.

Abbreviations. A, terminal apophysis; C, conductor; E1, E2, embolus.; M, median apophysis; P, paracymbium; R, radix; T, tegulum; ST, subtegulum.

Scale lines. 1.0 mm; genitalia 0.1 mm.

the tegulum, T in Fig. 365). Distally, the stalk emerges, expands, and forms a visible part of the embolus (E2 in Figs. 363, 364). The terminal apophysis is a complex structure whose surface is a large disk, which is visible in mesal view (A in Fig. 363). The palpus has no paramedian apophysis.

Note. The illustrations were made from specimens from Lebanon in the MNHN, redrawn with the help of specimens from Croatia in the MCZ collection. Figure 365 was drawn from a Croatian male.

Natural History. One female in Israel was found under a stone, another among leaves on the ground, close to a tree trunk. The spiders did not have a web and would not build in the laboratory (G. Levy, personal communication).

Distribution. Southeastern Europe, Lebanon, and Israel.

LITERATURE CITED

ARCHER, A. F. 1941. Supplement to the Argiopidae of Alabama. Museum Paper, Geological Survey, Alabama, **18**: 1–47.
 ———. 1966. Nuevos Argiopidos (Arañas) de las Antillas. Caribbean Journal of Science, **5**: 129–133.
 ———. 1971. Especies Nuevas de Argiopidos Peruanos. Revista Peruana de Agrícola, Lima, **14**: 157–159.
 BANKS, N. 1905. Arachnids from Cocos Island. Pro-

ceedings of the Entomological Society of Washington, **7**: 20–23.
 BLACKWALL, J. 1866. A list of spiders captured in the southeast region of equatorial Africa, with descriptions of such species as appear to be new to arachnologists. The Annals and Magazine of Natural History, Ser. 3, **18**: 451–468.
 BONNET, P. 1956. Bibliographia Araneorum. Toulouse **2**(2): 919–1926.
 ———. 1957. Bibliographia Araneorum. Toulouse, **2**(3): 1927–3026.
 ———. 1959. Bibliographia Araneorum. Toulouse, **2**(5): 4231–5058.
 BRIGNOLI, P. 1983. A Catalogue of the Araneae Described between 1940 and 1981. Manchester: Manchester Univ. Press. 755 pp.
 BROWN, F. MARTIN. 1941. A gazetteer of entomological stations in Ecuador. Annals of the Entomological Society of America, **34**: 809–851.
 BUTLER, A. G. 1873. A monographic list of the species of Gasteracantha or crab-spiders, with descriptions of new species. Transactions of the Entomological Society of London, **1873**: 153–180.
 CAMBRIDGE, F. P.-. 1904. Arachnida, Araneidea and Opiliones. **2**: 465–545. In Biologia Centrali-Americana, Zoologia, London.
 CAMBRIDGE, O. P.-. 1874. On some new genera and species of Araneidea. Annals and Magazine of Natural History, Ser. 4, **14**: 169–183, plate 17.
 ———. 1875. Arachnida (1874). Zoological Record, **11**: 221–235.
 ———. 1877. On some new genera and species of Araneidea. Annals and Magazine of Natural History, Ser. 4, **20**: 26–39, plates 6, 7.
 ———. 1879. On some new and little known species of Araneidea, with remarks on the genus *Gaster-*

- acantha*. Proceedings of the Zoological Society of London, **1879**: 279–293.
- . 1881. On some new genera and species of Araneidea. Proceedings of the Zoological Society of London, **1881**: 765–775.
- . 1889–1902. Arachnida, Araneidea. **1**: 1–317. In *Biologia Centrali-Americana, Zoologia*, London.
- CHAMBERLIN, R. V. 1925. Diagnoses of new American Arachnida. Bulletin of the Museum of Comparative Zoology, **67**: 211–245.
- CHICKERING, A. M. 1953. A new species of *Hypognatha* from Panama. Breviora, Museum of Comparative Zoology, **23**: 1–5.
- EBERHARD, W. G. 1986. Effects of orb-web geometry on prey interception and retention, pp. 70–100. In W. A. Shear (ed.), *Spiders, Webs, Behavior and Evolution*. Stanford, CA: Stanford Univ. Press.
- FABRICIUS, J. C. 1787. Mantissa Insectorum sistens eorum species nuper detectas adiectis characteribus genericis, differentiis specificis, emendationibus, observationibus. Hafniae, **1**: 1–348.
- GÉTAZ, A. 1893. Fauna arachnologica de Costa Rica. Anales del Instituto Físico-Geográfico Nacional de Costa-Rica, **4**: 103–106.
- GIEBEL, C. G. 1863. Drei und zwanzig neue und einige bekannte Spinnen der Hallischen Sammlung. Zeitschrift für die Gesamten Naturwissenschaften, **211**: 306–328.
- GLUECK, S. 1994. A taxonomic revision of the orb weaver genus *Acacesia* (Araneae: Araneidae). Psyche, **101**: 59–84.
- GRASSHOFF, M. 1984. Die Radnetzspinnen-Gattung *Caecrostris* (Arachnida: Araneae). Revue de Zoologie Africaines, **98**: 725–765.
- GUÉRIN-MÉNEVILLE, F. E. 1825. [Articles on spiders]. Encyclopédie méthodique. Histoire Naturelle. Insectes, Paris, **10**: 263.
- . 1840. Gastéranthes sculptée at de Feisthamel, nouvelles Espèces d'Aranéides. Revue Zoologique par la Société Cuvérienne, Paris, **1839**: 109–111.
- HAHN, C. W. 1834. Die Arachniden. Nürnberg, **2**: 1–75.
- HENTZ, N. M. 1850. Descriptions and figures of the Araneids of the United States. Boston Journal of Natural History, **6**: 18–35.
- HOLMBERG, E. L. 1876. Aracnidos Argentinos. Anales de Agricultura, **4**: 143.
- ICZN. 1955. International Code of Zoological Nomenclature, 3rd ed. London. 338 pp.
- KEYSERLING, E. 1863. Beschreibungen neuer Spinnen. Verhandlungen der k. k. Zoologisch-Botanischen Gesellschaft in Wien, **13**: 369–382.
- . 1880. Neue Spinnen aus Amerika. Verhandlungen der k. k. Zoologisch-Botanischen Gesellschaft in Wien, **29**: 293–350.
- . 1892. Die Spinnen Amerikas, Epeiridae. Nürnberg, **4**: 1–208.
- KOCH, C. L. 1838. Die Arachniden. Nürnberg, **4**: 1–144.
- . 1839. Die Arachniden. Nürnberg, **5**: 1–158.
- . 1845. Die Arachniden. Nürnberg, **11**: 1–174.
- LEVI, H. W. 1964. American spiders of the genus *Phoroncidia* (Araneae: Theridiidae). Bulletin of the Museum of Comparative Zoology, **131**: 65–86.
- . 1977. The American orb-weaver genera *Cyclosa*, *Metazygia* and *Eustala* north of Mexico (Araneae, Araneidae). Bulletin of the Museum of Comparative Zoology, **148**: 61–127.
- . 1978. The American orb-weaver genera *Colphepeira*, *Micrathena* and *Gasteracantha* north of Mexico (Araneae, Araneidae). Bulletin of the Museum of Comparative Zoology, **148**: 417–442.
- . 1985. The spiny orb-weaver genera, *Micrathena* and *Chaetacis* (Araneae: Araneidae). Bulletin of the Museum of Comparative Zoology, **150**: 429–615.
- . 1992. The American species of the orb-weaver genus *Carepaxis* and the new genus *Rubrepaira* (Araneae: Araneidae). Psyche **98**: 251–264.
- . 1993a. American *Neoscona* and corrections to previous revisions of Neotropical orb weavers (Araneae: Araneidae). Psyche, **99**: 221–238.
- . 1993b. The Neotropical orb-weaving spiders of the genera *Wixia*, *Pozonia* and *Ocrepeira* (Araneae: Araneidae). Bulletin of the Museum of Comparative Zoology, **153**: 47–141.
- . 1993c. The new orb-weaver genus *Lewispeira* (Araneae: Araneidae). Psyche, **100**: 127–136.
- . 1993d. The orb-weaver genus *Kaira* (Araneae: Araneidae). The Journal of Arachnology, **21**: 209–225.
- . 1994. New species of *Bertrana* and *Amazonepeira*, orb-weaving spiders from the Neotropics (Araneae: Araneidae). Transactions of the American Microscopical Society, **113**: 229–241.
- . 1995a. The Neotropical orb-weaver genus *Metazygia* (Araneae: Araneidae). Bulletin of the Museum of Comparative Zoology, **154**(2): 63–151.
- . 1995b. Orb-weaving spiders *Actinosoma*, *Spilasma*, *Micrepeira*, *Pronous* and four new genera (Araneidae: Araneae). Bulletin of the Museum of Comparative Zoology, **154**: 153–213.
- LEVY, G. (ED.). 1985. [Terrestrial invertebrates.] In A. Alon (ed.), [Plants and Animals of the Land of Israel], Vol. 2. Israel: Society for Protection of Nature. 175 pp. (in Hebrew).
- LINNÉ, C. DE. 1767. Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus differentiis, synonymis, locis, 13th ed. Stockholm, **1**: 1030–1037.
- MARX, G. 1883. Araneina, pp. 21–26. In L. O. How-

- ard (ed.), *A List of the Invertebrate Fauna of South Carolina*. Charleston.
- MCCOOK, H. C. 1894. *American Spiders and Their Spinningwork*, Vol. 3, pp. 1-285. Philadelphia.
- MELLO-LEITÃO, C. F. DE. 1917. Notas arachnológicas. V. Especies novas ou pouco conhecidas do Brasil. *Broteria*, **15**: 74-102.
- . 1932. Notas sobre as Micratheneas do Brasil. *Annaes da Academia Brasileira de Sciencias*, **4**(2): 73-97, 2 plates.
- . 1947. Aranhas do Paraná e Santa Catarina, das coleções do Museu Paranaense. *Arquivos do Museu Paranaense*, **6**: 231-304.
- NEAVE, S. A. 1939a. *Nomenclator Zoologicus*, A-C. Vol. 1. London: Zoological Society of London. 957 pp.
- . 1939b. *Nomenclator Zoologicus*, D-L. Vol. 2, London: Zoological Society of London. 1,025 pp.
- . 1940. *Nomenclator Zoologicus*, M-P. Vol. 3, London: Zoological Society of London. 1,065 pp.
- NICOLET, H. 1849. Arácnidos. In C. Gay (ed.), *Historia Física y Política de Chile*. *Zoologia*, **3**: 319-543.
- PALLAS, P. S. 1772. *Spicilegia Zoologica*. Berolini, **1**(9): 44-50.
- PALLISTER, J. C. 1956. Skippers taken on the Frank C. Johnson Entomological Expedition to Peru, with distributional and ecological notes (Lepidoptera, Hesperíidae). *American Museum Novitates*, **1763**: 1-69.
- PAYNTER, R. 1992. *Ornithological Gazetteer of Bolivia*, 2nd ed. Cambridge, MA: Museum of Comparative Zoology. 187 pp.
- PAYNTER, R., AND M. A. TRAYLOR, JR. 1991. *Ornithological Gazetteer of Brazil*, 2 vols. Cambridge, MA: Museum of Comparative Zoology. viii + 789 pp., 2 maps.
- PERTY, M. 1833. Arachnides Brasiliensis. In J. B. de Spix and F. P. Martius (eds.), *Delectus Animalium Articularum quae in itinere per Braziliam ann. 1817 et 1820 colligerunt*. Monachii, 191-209.
- PETRUNKEVITCH, A. 1930. The spiders of Porto Rico. *Transactions of the Connecticut Academy of Arts and Sciences*, **30**: 1-355.
- ROEWER, C. F. 1942. *Katalog der Araneae von 1758 bis 1940*. Bremen, **1**: 1-1040.
- SEDGWICK, W. C. 1973. New species, records and synonyms of Chilean Theridiid spiders. *Psyche*, **80**: 349-354.
- SIMON, E. 1864. *Histoire naturelle des Araignées (Aranéides)*. Paris: Librairie Encyclopédique de Roret. 540 pp.
- . 1876. [Description d'Araignées nouvelles.] *Annales de la Société Entomologique de France*, 5 Série, **6**(Bulletin): lxxxvi-lxxxviii.
- . 1884. *Etudes arachnologiques*. 16 e Mémoire XXIII. Matériaux pour servir à la faune de Arachnides de la Grèce. *Annales de la Société Entomologique de France*, 6 Série, **4**: 305-356.
- . 1894. *Histoire naturelle des Araignées*. Paris, **1**: 489-760.
- . 1895a. Description d'espèces et de genres nouveaux de l'ordre des Araneae. *Annales de la Société Entomologique de France*, **64**: 131-160.
- . 1895b. *Histoire naturelle des Araignées*. Paris, **1**: 761-1084.
- . 1897. *Etudes arachnologiques*. 27e Mémoire. XLIII. Descriptions d'espèces nouvelles de l'ordre des Araneae. *Annales de la Société Entomologique de France*, **65**: 465-510.
- SOARES, B. A. M., AND H. F. DE ALMEIDA CAMARGO. 1948. Aranhas coligadas per la Fundação Brasil-Central (Arachnida-Araneae). *Boletim do Museu Paraense E. Goeldi*, **10**: 355-409.
- STRAND, E. 1915. Systematisch-faunistische Studien über paläarktische, afrikanische und amerikanische Spinnen des senckenbergischen Museums. *Archiv für Naturgeschichte*, **81**: 1-153.
- SUNDEVALL, J. C. 1833. *Conspectus Arachnidum*, pp. 1-39 Londini Gothorum.
- TACZANOWSKI, L. 1873. Les Aranéides de la Guyane française. *Horae Societatis Entomologicae Rossicae*, St.-Petersbourg, **9**: 64-150, 261-286.
- . 1879. Les Aranéides du Pérou Central. *Horae Societatis Entomologicae Rossicae*, St.-Petersbourg, **15**: 102-136.
- THORELL, T. 1859. Una exotisca Epeirider. Öfversigt af Kongl. Vetenskaps-Akademiens Förhandlingar, **16**: 299-304.
- . 1868. Araneae. Species Novae minusve cognitae. In C. A. Virgin (ed.), *Kongliga Svenska Fregatten Engenies Resa Omkring Jorden*, *Zoologi*, **1**: 1-34.
- . 1878. Studi sui Ragni Malesi e Papuani. *Annali del Museo Civico di Storia Naturale di Genova*, **13**: 1-317.
- . 1898. Viaggio di Leonardo Fea in Birmania e regioni vicine. *Annali del Museo Civico di Storia Naturale di Genova*, **39**: 271-378.
- . 1899. Araneae Camerunenses quas anno 1891 collegerunt Cel. Dr. Y. Sjöstedt aliique. *Bihang Svenska Vetenskaps-Akademiens Handlingar*, Stockholm, **25**: 1-105.
- TRAW, B. (in press). A revision of the Neotropical orb-weaving spider genus *Scoloderus* (Araneae: Araneidae). *Psyche*.
- TULLGREN, A. 1905. Araneida from the Swedish Expedition through the Gran Chaco and the Cordilleras. *Arkiv för Zoologi*, Stockholm, **2**: 1-81.
- WALCKENAER, C. A. 1805. *Tableau des Aranéides*. Paris: Librairie Encyclopédique de Roret. 88 pp.
- . 1836. *Histoire naturelle des insectes*. Ap-tères. Paris, **1**: 1-682.
- . 1841. *Histoire naturelle des insectes*. Ap-tères. Paris, **2**: 1-548.

INDEX

Valid names are printed in italics. Page numbers refer to the main references, starred page numbers to illustrations.

- Acrosoma*, 105, 140, 144
alho, *Hypognatha*, 121*, 122
aneda, *Xylethrus*, 137*, 139
anomala, *Epeira*, 145
anomala, *Gasteracantha*, 145
anomala, *Micrathena*, 144, 145
anomalum, *Encacosoma*, 144, 145, 149*
anomid, *Xylethrus*, 137*, 138
Aranea, 140
aracak, *Xylethrus*, 137*, 139
atlantica, *Plectana*, 142
batesi, *Gasteracantha*, 143
belem, *Hypognatha*, 115, 117*
biloba, *Bunocrania*, 140
biolleyi, *Gasteracantha*, 142
branickii, *Inca*, 145
brevispina, *Gasteracantha*, 143
Bunocrania, 140
cacau, *Hypognatha*, 121*, 122
Caerostris, 93
callida, *Gasteracantha*, 142
Calydna, 91
cambara, *Hypognatha*, 113*, 114
camerunensis, *Gasteracantha*, 141*, 143
cancer, *Epeira*, 142
cancriformis, *Aranea*, 140
cancriformis, *Gasteracantha*, 140, 141*, 142
carolinus, *Vibradellus*, 142
carpish, *Hypognatha*, 110, 111*
coccinellina, *Hypognatha*, 105
coccinellina, *Hypophthalma*, 105
colosso, *Hypognatha*, 126, 127*
columbiae, *Gasteracantha*, 142
comstocki, *Gasteracantha*, 142
coyo, *Hypognatha*, 115, 119*
cruciata, *Hypognatha*, 105
cryptocephala, *Hypognatha*, 99, 101*
Cyrtarachne, 151
decentuberculata, *Cyrtarachne*, 151
decentuberculata, *Glyptogona*, 151
decentuberculatum, *Encacosoma*, 149*, 151
decora, *Hypognatha*, 105
decora, *Paraplectana*, 105
deplanata, *Hypognatha*, 123, 125*
deplanata, *Hypophthalma*, 123
divuca, *Hypognatha*, 121*, 122
elaborata, *Hypognatha*, 116, 119*
elipsoides, *Gasteracantha*, 142
elliptica, *Gasteracantha*, 142
Encacosoma, 144
Encyosaccus, 125
Epeira, 140, 142, 144, 145, 152
Eurycorma, 91
Eurysona, 91, 93
feisthameli, *Gasteracantha*, 105
frenca, *Encacosoma*, 147, 149*
fumosa, *Gasteracantha*, 146
furcifera, *Hypognatha*, 126, 127*
furcifera, *Mutina*, 126
Gasteracantha, 105, 140, 146
gayi, *Gasteracantha*, 146
geometrica, *Hypognatha*, 109
geometrica, *Hypophthalma*, 109
Glyptogona, 144, 152
hexacantha, *Acrosoma*, 140
hexacantha, *Aranea*, 140
hexacantha, *Gasteracantha*, 140
hilaris, *Gasteracantha*, 142
Hypognatha, 91
Hypophthalma, 91, 100
ica, *Hypognatha*, 118, 119*
Inca, 145
insulana, *Gasteracantha*, 142
ituara, *Hypognatha*, 110, 111*
jacaze, *Hypognatha*, 127*, 128
jananari, *Hypognatha*, 116, 117*
javiium, *Encacosoma*, 149*, 150
joinvillensis, *Gasteracantha* *kochii*, 142
kochii, *Gasteracantha*, 142
lagos, *Hypognatha*, 100, 103*
lanoka, *Hypognatha*, 103*, 104
lata, *Epeira*, 140
leprosa, *Glyptogona*, 145
maranon, *Hypognatha*, 119*, 120
maria, *Hypognatha*, 112, 113*
mascula, *Gasteracantha*, 142
matisia, *Hypognatha*, 114, 117*
maura, *Gasteracantha*, 142
mirandaribeiroi, *Hypognatha*, 110, 111*
moesta, *Gasteracantha*, 142
mozambi, *Hypognatha*, 100, 103*, 107*
multilobata, *Hypognatha*, 151
multilobatum, *Encacosoma*, 149*, 151
Mutina, 91
nasuta, *Hypognatha*, 103*, 104, 107*
navio, *Hypognatha*, 107*, 108
nicoleti, *Gasteracantha*, 146
oldendorffi, *Gasteracantha*, 142
pallida, *Gasteracantha*, 142, 146
Paraplectana, 93
pennata, *Gasteracantha*, 146
periviroi, *Hypognatha*, 115, 117*
perlatus, *Xylethrus*, 133*, 136
peruanus, *Xylethrus*, 134
Phoroncidia, 146
picea, *Gasteracantha*, 142
Plectana, 142
preciosa, *Gasteracantha*, 142
proboscidea, *Gasteracantha*, 142
prospiciens, *Calydna*, 105